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Study Protocol: A Randomised Controlled Trial on Effectiveness of a Worksite Health Intervention on Common Musculoskeletal Problems and Work-Related Quality of Life (WRQoL) among Female Workers in the Garment Manufacturing Sectors

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Abstract

Garmenting is one of the many labour intensive sector that provides gateway for developing countries in entering into the global market. Southern production centres employ more than 80% women as part of their workforce. Working for a long period of time without rest, absence of personal protective equipment and inadequate provision of ergonomic facilities at workplace leads to discomfort and fatigue.

Method and Method: 150 female workers with common musculoskeletal problems and working at the selected garment manufacturing factories and fulfilling the selection criteria will be randomly assigned to experimental and control group. The work site health intervention will be provided to experimental group, which involves 3 sessions for a week namely orientation to body mechanics, demonstration on neck and lower back exercise and nutritional education. After the demonstration, the female worker will be instructed to perform the exercise, 5 times in a week for 2 week in the workplace and thereafter for at least 3 times in a week for a month in the home. The outcome will be assessed at end of the 2nd week and 5th week. The control group who will not receive any intervention. The data will be analysed by frequency, percentage distribution, mean and standard deviation. Chi-square test and independent t-test will be used to assess the difference in various parameters.

Discussion: The result of the study may help to guide the garment workers to initiate the simple intervention in the worksite and would also reduce the occurrence of the common musculoskeletal problems.

Keywords: *Worksite Health Intervention, Musculoskeletal problem, Work-Related Quality of Life, female Workers, Garment manufacturing sectors.*

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Introduction

Garmenting is one of the many labour-intensive sectors that provide a gateway for developing countries in entering into the global market. It offers important opportunities to countries to start industrializing their economies and in course of time diversify away from commodity dependence[(1)].

The garment sector is a thriving industry in

Bangalore, Tirupur and Chennai in the south, and in Delhi and surrounding NCR region in the north. While the northern production centres employ primarily a male workforce, in the south more than 80% of the workforce is women.[2]

Women who are sewing mission operators perform their tasks sitting which involves two work tasks. The first one is the "sewing" task. The female worker sits on a chair, leans forward at an angle of 45, and moves her hands backward and forward and to the left and right to move the fabric (45-100 times per minute). The arms are positioned over the machine at an angle between 45 and 90 to the trunk. The head is positioned forward at an angle between 10 and 20. One of the legs moves the pedal of the sewing machine but the other is static. During the second work task, the female worker bends down to the right at an angle of 45 in order to get the pieces such as zippers and the like (30-50 times per minute)[3].

A study conducted in India reported, that out of 3858 workers examined during their annual health appraisal, around 694 (18.0%) had applied leave due to illness, of these only 104 (2.7%) had extended to more than 15 days. As a common symptom, worker who performs processing jobs with a longer duration of standing may experience discomfort in the legs, neck and shoulder. If standing position is practiced continuously, the worker may feel discomfort and fatigue particularly in the lower limb muscles, lower back, and feet. As along-term consequence, prolonged standing contributes to severe health problems such as chronic venous disorders, circulatory problems and degenerative damage to the joints of the spine, hip, knees and feet. [4].

Exposure to MSDs risk factors are increasing in younger working population [5]. Though factory workers areat risk for various health problems, the literature support makes it evident that the prevalence of musculoskeletal problem is the most common problems among garment factoryworkers varied from 15.5% to 78.89%.The most reported problem among those involved in sewing, cutting, and deliveringwas back pain,with the prevalence ranging from 22.2% and 68.5%. The common causes for the musculoskeletal problems were continuous sitting for long hours, bending and twisting at the waist, abnormal posture, movements during work and continuous standing. Nutrition plays a key role among these workers as improper or inadequate diet leads to malnutrition, whichmay further aggravate theseproblems[6].

A recent ILO study estimated that 22% of the global workforce, or 614.2 million workers, work more than 48 hours per week. According to a multi-country study in the clothing industry, reports that, workers had to work overtime in order to earn wages. The study also concluded that on an average factory workers worked more than 60 hours per week, and in 88% of cases more than six days in a row[7].

In Bangladesh, many garment workers work 14-16 hours shifts each day (most often six days per week) in Pakistan, 10 or more hours a day. In Thailand during peak season, excessive overtime is common because factory owners are reluctant to hire additional workers. During off-peak season, the average working hours is 7.7 to 10 hours a day. In India and Laos this overtime, though against the law, is compulsory[8].

According to the European survey on working conditions, 8.1% to 72.9% of workers reported exposure to risk factors of musculoskeletal disease[s][5]. Beyond different recognition practices, there are indications that musculoskeletal diseases affect the female working population more than the males. Further, there is a severe lack of awareness about these issues.

The musculoskeletal problems and the discomfort experienced by the individuals is also depend on the way an individual eat and the type of nutrients and fluids that brought into the body. Certain products and treatments may accelerate the rate in which the body heals itself.Some of the treatment included are Transcutaneous Electric Nerve Stimulator, electrotherapy, acupuncture, massage, icing, and anti-inflammatories. While these treatments are available to reduce the inflammation, however it is necessary to control the levels of inflammation around the joints of the back with alternative approaches. One such approach that naturally adopted to reduce the inflammation is by diet modification,and increase the intake of natural anti-inflammatories foods in the diet. There are also vitamins and dietary supplements to improve musculoskeletal health. But the relationship is not studied.

Work-related musculoskeletal problem are often associated with lower level of quality of life. Very few studies only have evaluated the effect of a specific program on the prevention of WMSD and the quality of life (QL)[9].

In the last few decades, workplace ergonomics studies focusedmore;however,limited emphasis

were made on the worksite interventions to prevent work-related musculoskeletal problems. It has also beenreviewed from the literature that there is a strong evidence for positive effect on management of low back pain by exercise training on different population and settings.

With the above evidences, the investigator felt the need to find the Effectiveness of a Worksite Health Intervention on Common Musculoskeletal Problems and Work-Related Quality of Life (WRQoL) among female workers.

Materials and Method

The Primary Objective Includes:

1. To determine the common musculo- skeletal problems experienced by the female workers in the garment manufacturing sectors
2. To assess the Work-Related Quality of Life among female workers with musculo-skeletal problems experienced before implementation of Worksite Health Intervention.
3. To evaluate the effectiveness of Worksite Health Intervention on Common Musculoskeletal problems experienced and Work -Related Quality of Life among female workers

Study Design: The study adopts two-armed randomised control trial methodology, to assess the effectiveness of the Worksite Health Intervention on common musculoskeletal problems and work-related quality of life among females.

Ethical Consideration: As a part of research programme, Saveetha University Ethics Committee, Tamilnadu, approved the study. The ref.no: - 007/09/2017/ IEC/SU, which qualified for registration in the Clinical Trial Registry-India numberCTRI/2018/08/015168.

Setting: Out of the North, South, East and West zones of BBMP, north zone will be selected for data collection as this zone houses majority of the garment factories of Bangalore. The garment manufacturing factories are concentrated in Pennya industrial estate, Rajajinagar industrial estate, Yeswanthapur, Gorguntepalaya and Srirampura. Two study areas are to be selected by simple random sampling from the industrial database available. The factories are categorised into small medium and large sized on the basis of the number of workers in each factory.

Sample: To detect a medium effect size (0.5) in the quality of life (power 0.8; alpha 0.05) at a 2-sided significance level of 0.05, the sample size is estimated was 150, which was inflated to 200 anticipating 10-20% rate. Female workers (75 in experimental group and 75 in control group) in the age group of 18-60 years and are working in the selected setting with the main task as tailoring, helping; checking, cutting, designing,sewing, ironing and finishing will be screened for common musculoskeletal problems. 200 female workers with the musculoskeletal problems will be randomly chosen and assessed into experimental and control group. To recruit the subjects the following criteria will be used.

Inclusion Criteria: Female Workers:

- Working for a minimum of 6-8 hours in a day with minimum of 1year experience in the garment factory.
- Who areable to read and write in Tamil/Kannada/ English.

Exclusion Criteria: Female Workers:

- undergoing physiotherapy/any treatment for this problem
- who had undergone any surgery within a year
- who are diagnosed with structural anomalies
- who have spinal cord compression
- who are pregnant
- suffering with post-traumatic conditions.

Tool: Validity, reliability and pilot study:

The following standardised tools are used.

a. Nordic musculoskeletal questionnaire to assess the common musculoskeletal problem

b. SF 36V2 to assess the work-related quality of life

Nine expert had validated the tool, 3 from the department of community medicine 2 from physiotherapist, 3 nursing faculty with PhD and 1 nutritionist. In order to suit to the current setting the reliability of the tools has been once again tested by SPSS software and the Alpha Coefficient r=0.78 for Nordic musculoskeletal questionnaire and 0.89 for the work related quality of life, which is within the acceptable limit. Pilot study on 15 subjects performed proved the practicability of the study.

The Intervention Program: Written consent will be obtained after the oral and written information given by the researcher regarding the purpose and nature of the study, a detailed plan about the work site intervention, benefits, the risk involved, and withdrawal from the study. Confidentiality of the subjects would be maintained.

Pre-Intervention: Female workers in the garment factories will be assigned in to the experimental and control group. The common musculoskeletal problems and work related quality of life would be assessed.

Approximately 40-45 minutes will be given to the female garment workers to complete the questionnaire. After receiving the questionnaire, the data will be verified for the completion of data.

Work site Health Intervention: The work site health intervention to experimental group refers to a structured program developed by the researcher for the female workers in garment manufacturing sectors to change their unhealthy and ergonomic postures and to enable them to prevent the occurrence of common musculoskeletal problem. It comprises orientation to body mechanics, back exercise training, nutrition education involving lecture cum demonstration by the researcher. Each session would last for 10-15 minutes on all days.

Day 1: Orientation to body mechanics, anatomy of spine, function of the cervical spine and normal postures to be maintained in daily life by lecture method using charts and posters

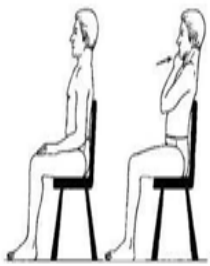
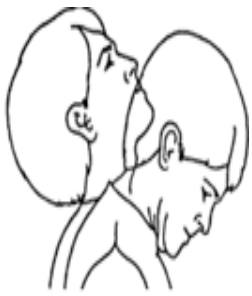
Day 2: Demonstration of exercises, which includes

- Neck exercise
  - Head retraction in sitting
  - Neck extension in sitting
  - Side bending of the neck
  - Neck flexion in sitting
- Low back exercise
  - Lying face down
  - Lying face down in extension
  - Flexion in lying
  - Flexion in sitting
  - Flexion in standing
  - Bottom to heal stretch
  - Bridges
  - Knee rolls
  - Hamstring stretch

The researcher demonstrates the exercise as shown in the Figure 1, at the workplace for 10-15 minutes and the participant are asked to follow. A ready reckoner would be provided to the participant.

Post intervention: After the training, the female factory workers are asked to perform the back exercise every day for at least 5 times a week for 2 weeks in the work place under the supervision of the researcher and at home for at least 3 times a week for a month. On Day 3, the researcher will be providing education on nutrition, which includes food pyramid, function of the food, concept of healthy eating and anti-inflammatory diet for 30-45 minutes by lecture cum discussion method.

The control group will not receive any intervention during the study period. But would receive the same after completion of the data collection.

			
Head retraction	Neck extension	Side bending of neck	Neck rotations/neck flexion

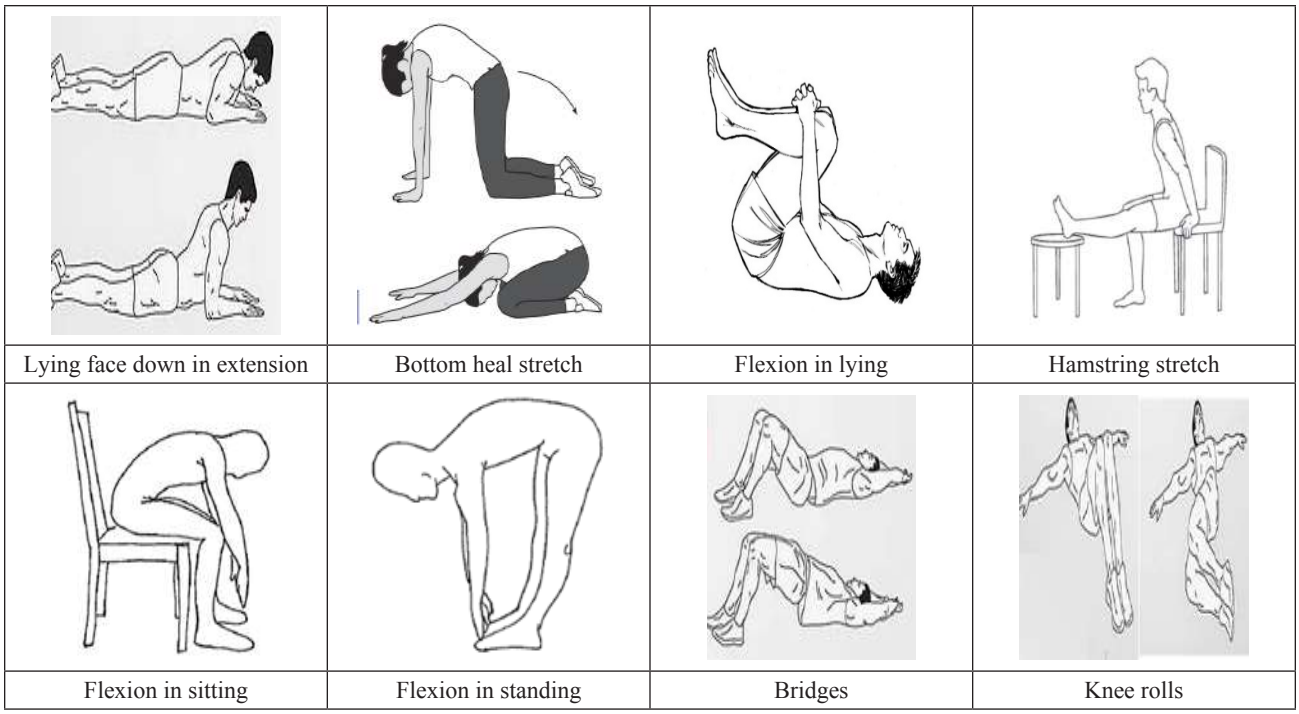


Figure 1: Illustration of the Neck and low back exercise

Outcome Measures: Baseline data includes age, height, weight, total family monthly income, type of family, habits type of job, duration of the work per day, availability of rest period during working hours, and option of over time.

Primary outcome measures

1. Musculoskeletal problems experienced and its intensity
2. Work-related quality of life

Randomization: The list of garment factories from the industrial database will be categorised into small and medium sized on the basis of the number of workers in each factory. A separate list of small size factories and medium sized factories will be prepared. The factories will be clustered into two; Cluster 'A' small sized factories and cluster 'B' medium sized factories. Using simple random sampling technique, from each cluster 2 factories will be allocated to intervention group and control group. Based on selection criteria samples will be drawn 75 in experimental and 75 to control group.

Blinding: Due to the nature of the research, the researcher will not be blinded and may know which factory will be receiving the intervention. However, the female workers participating in the research study neither will be aware of the expected outcomes of the study, nor the other group participating in the research study

Planned statistical analysis: All the data collected will be entered in the excel format. The data will be analysed using SPSS version 20.0. Frequency, percentage distribution, mean, standard deviation, Chi-square test and t-rest will be employed for the difference in the various parameters.

Discussion

Musculoskeletal problem is one of the common health problem experienced by the female factory workers. The workers neither take care of themselves nor have time to meet the health professionals. Studies revealed that incidence and recurrence of pain could be reduced when adequate care is provided. This study aims at designing a worksite health intervention that could be implemented during the working hours. The intervention designed would be simple and can be done in the work place itself. Changes in the intensity of pain in the lower back and neck would be noted before and after the intervention. Educating on the body postures and nutrition helps the workers to monitor their food and beverages conception. Modification in the diet helps to examine the changes in the quality of life. Result of this

study may help to guide the workers to initiate the simple intervention in the worksite reduce the occurrence of the musculoskeletal problems.

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Conflict of Interest: There is no conflict of interest.

Source of Funding: Self-funding research

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Health of the Elderly in India: A Socio-Legal Study

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Abstract

To study the health and social problems of the elderly and their attitude towards life. Materials and Method: Descriptive study carried out in the Field practice area of the Department of Community Medicine in South India. A total of 213 elderly patients (60 years old and above) who attended the outreach clinics were interviewed using a pre-tested schedule. Findings were described in terms of proportions and percentages to study the socio-economic status of the samples and its correlation to social problems. Results: Around 73% of the patients belonged to the age group of 60-69 years old. Nearly half of the respondents were illiterate. Around 48% felt they were not happy in life. A majority of them had health problems such as hypertension followed by Arthritis, Diabetes, Asthma, Cataract, and Anemia. About 68% of the patients said that the attitude of people towards the elderly was that of neglect.

Keywords: *Elderly, Morbidity, Social and Health Problems.*

Introduction

"One who always serves and respects elderly is blessed with four things: Long Life, Wisdom, Fame and Power"- Manusmriti Chapter 2:121.

"Trees grow over the years, rivers wider, Likewise, with age, human beings gain immeasurable depth and breadth of experience "and wisdom. That is why older persons should be not only respected and revered; they should be utilized as the rich source to society that they are."- Kofi Annan.

"A society for all ages is one that does not caricature older persons as patients and pensioners. Instead, it sees them as both agents and beneficiaries of development. It honors traditional elders in their leadership and consultative roles in communities throughout the world." -Kofi Annan United Nations Secretary-General 1 October 1998

"It is not sufficient to add years to life but the more important objectiveis to add life to years"-

WHO Slogan S.:

The popular saying, "old is Gold' which implies the gravity of aged on the earth. All the things get aged. The things around us both animate and inanimate go through this aging process. The things which don't have life earn currency and given a due place and reverence on account of aged.

The thing such as old swords, old Icon, old buildings, Cars and so forth. Are revered due to their aged. On contrary, the objects which have life such as animals, human beings are thrown useless things. The old people are not treated well and they need special care and policies for their autumn days. The increasing number of aged population, due to advancement in medical sciences, health care etc, amount a problem on both developed as well as developing countries. The policy makers and social scientists focus their attention to abate the seriousness of the problem, which pose before countries, particularly third world countries. For understanding the problem of these aged, we have to know the basic concepts like aging.

Aging is natural, inevitable and ubiquitous phenomenon. Everyone should confront this process, if he/she lives. It is irreversible one. Literally it refers to the effects of age. Commonly speaking, it means the various effects or manifestation of old age. In this sense, it refers to various deterioration in the organisms. Aging has been viewed differently by different persons. To politicians and Industrialists, it means power and wealth whereas to a middle class employee, it amounts to a

forced retirement. To biologists and social scientists, it is a field of research on biological cells and problems on individual respectively. Handler defined "Aging is the deterioration of nature organism resulting from the dependent essentially irreversible changes intrinsic to all members of a species such that, with the passage of time. They become increasingly unable to cope with the stresses of the environment thereby increasing the probability of death". Beckar defines aging in the broader sense as "Changes coursing in an individual as the result of the passage of time". He adds "Aging consists of two simultaneous components of anabolic building up and catabolic breaking down". Comfort regards it as "the total effect of all changes which occur in a living being with increasing chronological age and which render it more vulnerable or less viable". Birren and Renner define "aging refers to the regular changes that occur in mature genetically representative organisms living under representative environmental conditions as they advance in chronological age". According to Hurlock, old age is the closing period in the life span. It is a period when people move away from previous, more desirable periods or times of usefulness. Stieglitz has rightly observed that "aging is a part of living.

Aging begins with conception and terminates with death. It cannot be arrested unless we arrest life. We may retire aging or accelerate it but we cannot arrest while life goes on, because it is essentially an element in living"[3]

Demographic Profile of Elderly in India: India, the world's second most crowded nation, has encountered a sensational statistic progress in the previous 50 years, involving very nearly a significantly increasing of the populace beyond 60 years old years. This example is ready to proceed. It is anticipated that the extent of Indians matured 60 and more seasoned will ascend from 7.5% in 2010 to 11.1% in 2025 UNDESA (United Nations Department of Economic And Social Affairs, 2008). This is a little rate point increment, yet a surprising figure in supreme terms. As per UNDESA information on anticipated age structure of the populace (2008), India had more than 91.6 million older in 2010 with a yearly expansion of 2.5 million old somewhere in the range of 2005 and 2010. The quantity of old in India is anticipated to arrive at 173 million out of 2026 and the share of older persons, above 60 years, in 2050, in India's population is projected to increase drastically by 20 percent.

Rundown figures veil the unevenness and complexities of the statistic progress inside India crosswise over Indian states with various degrees of financial improvement, social standards, and political settings. Anticipated appraisals of populace structure in 2025 for North India hold a "pyramidal" shape, while for south India, the portion of the older populace is required to grow significantly. Straight development in the number of inhabitants in the older is normal in the following 100 years, with more extreme slopes of increment in focal and east India and leveling off of supreme quantities of old in the north, south, west, and upper east.

A few important characteristics of the elderly population in India are noteworthy. Of the 8.5% of the population who are elderly, two-thirds live in villages and nearly half are of poor socioeconomic status (2016 report by the ministry for statistics and programme implementation). Half of the Indian elderly are dependents, often due to widowhood, divorce, or separation, and a majority of the elderly are women (70%). Of the minority (2.4%) of the elderly living alone, more are women (3.49%) than men (1.42%). Thus, the majority of elderly resides in rural areas, belongs to low SES, and is dependent upon their families.

While the southern states (Andhra Pradesh, Karnataka, Kerala, and Tamil Nadu) might be viewed as the greatest drivers of maturing in India, other Indian states (quite Haryana, Himachal Pradesh, Maharashtra, Orissa, and Punjab) are likewise encountering an old populace blast, to a great extent in provincial regions. Enormous scale investigations of the wellbeing practices of this developing old Indian populace are rare. In any case, data assembled from various overviews and provincial and neighborhood studies point to the high commonness of a few dangerous practices, for example, tobacco and liquor use, and physical dormancy. With these stressors, typically, total information contrasting the 52nd (1995–1996) and 60th Rounds (2004) of the National Sample Survey (NSS) propose a general increment in the reports of infirmities and usage of human services administrations among the old. Access to administrations, be that as it may, is uneven the nation over.

An analysis of morbidity patterns by age clearly indicates that the elderly experience a greater burden of ailments (which the National Sample Survey Organisation defines as illness, sickness, injury, and

poisoning) compared to other age groups (see National Sample Survey Organisation, 2006, Fig. 1), across genders and residential locations. The elderly most frequently suffer from cardiovascular illness, circulatory diseases, and cancers, while the non-elderly face a higher risk of mortality from infectious and parasitic diseases. In developed countries advancing through demographic transition, there have been emerging epidemics of chronic non-communicable diseases (NCDs), most of which are lifestyle-based diseases and disabilities In contrast, India's accelerated demographic transition has not been accompanied by a corresponding epidemiological transition from communicable diseases to NCDs. As indicated in Figure 15-1, the Indian elderly are more likely to suffer from chronic than acute illness. There is a rise in NCDs, particularly cardiovascular, metabolic, and degenerative disorders, as well as communicable diseases. While cardiovascular disease is the leading cause of death among the elderly, multiple chronic diseases afflict them: chronic bronchitis, anemia, high blood pressure, chest pain, kidney problems, digestive disorders, vision problems, diabetes, rheumatism, and depression. Concurrently, the prevalence of morbidity among the elderly due to re-emerging infectious diseases is quite high, with considerable variations across genders, areas of residence, and socioeconomic status. It is projected that NCD-related disability will increase and contribute to a higher proportion of overall national disability, in step with the graying of the population. However, a very significant shortcoming of most of the above studies is the use of self-reported data, which, in the absence of autopsies and physician examinations of patients, represents enormous lacunae in data on the conditions affecting the elderly. More detailed studies are needed, other than surveys, to extract information on the epidemiology of health conditions experienced by the elderly.

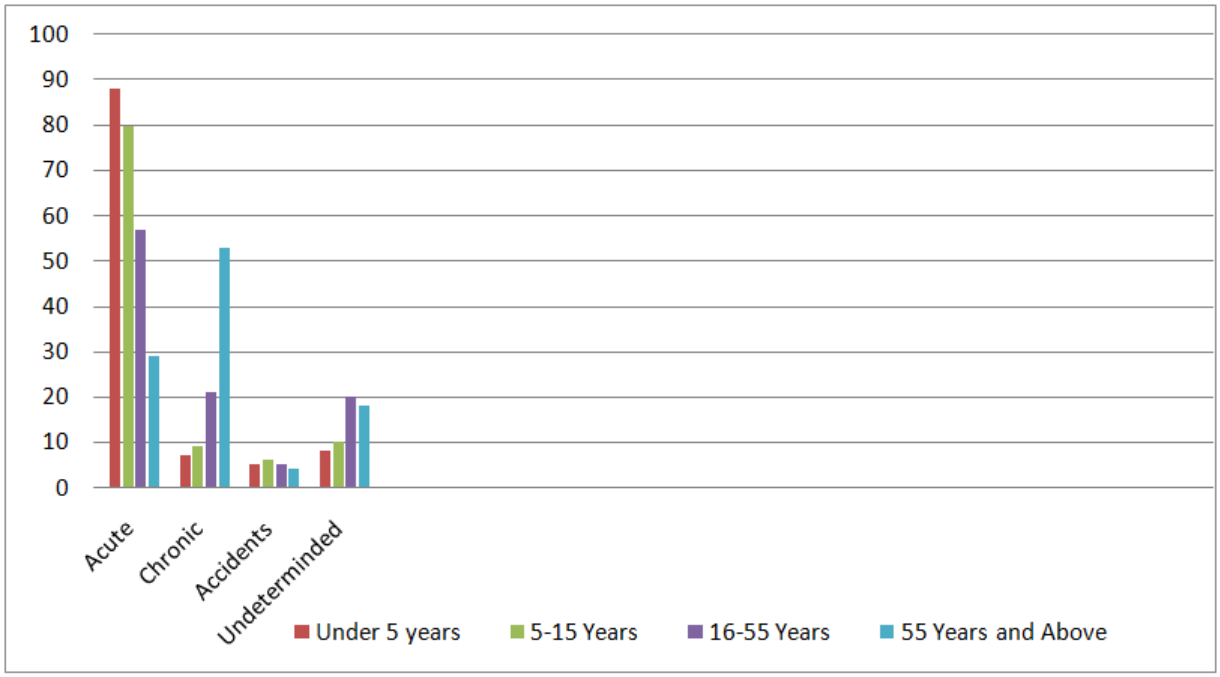

Figure 1: Burden of illness type among Indians. SOURCE: Dror, Putten-Rademaker, and Koren (2008)

Social Factors: A more intensive take a gander at the writing on access to human services uncovers variety over an age angle. More established Indians have revealed higher paces of out-patient and inpatient visi. The age angle in older wellbeing access is overlaid by social determinants of wellbeing. For one, there is a feminization of the old populace; as indicated by the 2001 registration, the sexual orientation proportion among the Indian old matured 60 years and more seasoned is 1,028 females for 1,000 guys. It is normal that by 2016, 51% of India's old will be ladies (in provincial regions, this extent will be a lot higher). More ladies report weakness status when contrasted with guys, but a far more noteworthy extent of men is hospitalized

when contrasted with females (87 versus 67 for each 1,000 matured people).

Neglected well being needs are progressively articulated among the 33.1% of the old in India who in 2001 were accounted for to have lost their mates, of whom a bigger relative extent is female (half of female old are widows versus just 15% of male older who are single men). Studies have demonstrated that widows are lopsidedly helpless against incapacity, ailment, and poor medicinal services use because of various portability, business, property, and monetary limitations.

Notwithstanding sexual orientation and conjugal status, religion, standing, instruction, financial autonomy, and sanitation have bearing on older wellbeing. Tally displaying of information from the 52nd Round of the NSS shows that the quantity of infections endured by an old individual, determined freely for rustic (Poisson Model) and urban populaces (Negative Binomial Model), incorporate age, sexual orientation, education, accessibility of drinking water and a latrine office, and family unit month to month utilization use. Another investigation of Uttar Pradesh (UP) and Maharashtra found that the older elderly (70 years and more seasoned) were altogether more averse to look for treatment contrasted with the 60–69 age classification, while Muslims were somewhere in the range of 62% and 49% bound to look for treatment in UP and Maharashtra, separately, contrasted with Hindus. This investigation found that old in booked clan/planned standing (SC/ST) classifications were 54% more uncertain and other in reverse classes (OBC) 35% more averse to look for treatment for existing diseases in Maharashtra contrasted with different ranks. At long last, secondary school graduates were twice as likely in UP and multiple times as likely in Maharashtra to look for treatment contrasted with the uneducated gathering. Be that as it may, in the previously mentioned examination, a greater part of the older experienced various bleakness conditions, which makes translating the exhibited outcomes troublesome. The nonattendance of thoroughly structured examinations that evaluate the sorts and seriousness of different sickness conditions in the old further features this reality utilizing information from a similar review, inferred that 9.5% of provincial occupants and 4.2% of urban occupants report absence of access to everyday necessities of drug, near twofold that of apparel and sustenance.

Broad Health Coverage: Planning and Needs: A pathway to national wellbeing change has been imagined by the Planning Commission in the number one spot up to the twelfth Five-Year Plan for India. In October 2010, a High-Level Expert Group (HLEG) was gathered by the Planning Commission to prescribe changes in wellbeing financing, medicate obtainment, network cooperation in wellbeing, wellbeing the executives, and physical and money related standards for wellbeing and HR. Arranging older wellbeing in a more extensive system of all inclusive access and moderateness of Universal Health Coverage (UHC) can possibly change the auxiliary conditions that hamper the prosperity of the matured. We abridge a portion of the manners by which UHC may serve these capacities, all through showing the proof holes that will be required for these capacities to be met.

Key UHC changes relevant to access incorporate the arrangement of extra HR at the Sub-Health Center level (per 5,000 populace), just as the presentation of an extra Community Health Worker (like an Accredited Social Health Activist) in rustic and low-salary urban regions. These changes would guarantee that notwithstanding existing needs of maternal and youngster wellbeing, rising needs in NCD control, just as activity on social and physical hindrances to get to, can be tended to locally (i.e., pair with Village Health and Sanitation Committees and their urban identical). Future research may help decide the extent of consideration at the Sub-Health Center level and the scope of promotive administrations gave at the town/network so as to take into account the necessities of India's older.

It has been proposed by the HLEG, additionally, that a fundamental bundle of consideration (including essential, optional, and tertiary-level administrations) be cashless at purpose of administration using a National Health Entitlement Card (which would likewise fill in as an identifier for Electronic Medical Records, conveying quiet chronicles and care-chasing profiles). This arrangement will be especially valuable for the older poor, and will require advancement and a far reaching exercise in information accumulation and assemblage on both the client and supplier sides. To this end, methodological commitments from progressing associate examinations, for example, the Longitudinal Study on Aging in India (LASI) and parallel endeavors universally will be very significant.

Various administrative instruments under the aegis of a recently proposed National Health Regulatory

and Development Authority will guarantee wellbeing framework backing, accreditation, and nonstop wellbeing frameworks assessment. This procedure may profit, once more, from the developing base of research on old clients of the wellbeing framework, who may have a more drawn out length of collaborations with the framework just as incredible variety regarding need and weight, affected by changing social determinants. Wellbeing frameworks assessment will also need to reflect age-explicit horribleness and mortality designs, just as that of intersectional older gatherings (the bereaved old, matured of religious minority status, and others).

Conclusion

The development of the older populace in the coming decades will carry with it exceptional weights of horribleness and mortality the nation over. As we have laid out, key difficulties to access to wellbeing for the Indian old incorporate social hindrances molded by sexual orientation and different tomahawks of social disparity (religion, position, financial status, shame). Physical obstructions incorporate diminished versatility, declining social commitment, and the constrained reach of the wellbeing framework. Wellbeing moderateness requirements incorporate restrictions in pay, business, and resources, just as the confinements of money related insurance offered for wellbeing consumptions in the Indian wellbeing framework.

Among the most critical discoveries that rose in building up this audit was the inadequacy of information on the weights of access and moderateness among older populaces in India. A noteworthy purpose behind this is standard wellbeing information gathering in India isn't intended to reflect or describe neurotic movement: a procedure wherein, by goodness of being alive longer than others, the older are bound to encounter a pathology, prompting impedance, practical impediments, and at last incapacity. Numerous standard information accumulation strategies (National Sample Surveys, Census information, or passing endorsements) in India don't catch neurotic movement nor do they disaggregate dreariness and inability results among the older.

Ethical Clearance is taken from Departmental Research Committee to Amity Law School, Amity University, NOIDA, U.P.

Source of Funding: Self

Conflict of Interest: Nil

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General Awareness of Diabetes Mellitus among a Hospital Population in Chennai: A Survey

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Abstract

Aim and Objective: The aim of this study is to assess the awareness of diabetes mellitus and knowledge about the various aspects of diabetes including types, treatment modalities, preventive measures and lifestyle modification in the patient population visiting a Dental Hospital in Chennai.

Materials and Method: In this study, a questionnaire was prepared and circulated among the subjects to determine the awareness and to inspect the knowledge about the symptoms, diagnosis and preventive measures about Diabetes mellitus among the people. The study sample comprised of totally 100 subjects, both males and females of age group between 20 and 50 years.

Results: According to the survey 52% of the individuals are aware about that diabetes can lead to further complications. 82% of the individuals felt that the diabetes can be controlled by exercise. 19% of individuals have not undergone any confirmatory tests for diabetes. 50% of the individuals were under medication for treatment of diabetes and they experienced side effects while taking those medications. 50% of the individuals who participated in the survey have attended a formal diabetes educational programme and they are aware of diabetes through media,relatives and doctors.

Keywords: *Diabetes, Medications, Dietary Habits, Exercise, Blood Glucose level.*

Introduction

Diabetes is a group of disease characterised by hyperglycaemia resulting from the defects in insulin secretion, insulin action or both[1]. According to recent World Health Organisation (WHO),India today leads the world with over 32 million diabetic patients and the number is projected to increase to 79.4 million by the year 2030[2]. There are two types of diabetes namely Type 1 Diabetes which is due to pancreas which stops producing the hormone insulin and Type 2 Diabetes which is due to combination of both the pancreas having reduced ability to produce insulin and body being resistant to action of insulin[3].

Further researchers have predicted a 65% rise in prevalence of diabetes due to population growth rate, age structure, urbanisation, unfavourably modifications of dietary habits and lifestyles, economic and health transition of the country and thus actual number of diabetes could be as high as 52 million by 2025[4]. And also the type 2 diabetes is seen in early adult lifeand seen in all age group of Indian populations. So for these reasons WHO declared India as the "Diabetic Capital"[5]. Several studies have been carried out to so as to reveal about the diabetes its complication,medications,diet plans and lifestyle modification for the treatment of it[6].

Failure to diagnose diabetes mellitus art an early stage due to various factors like insufficient knowledge, lack of public awareness about symptoms of diabetes,

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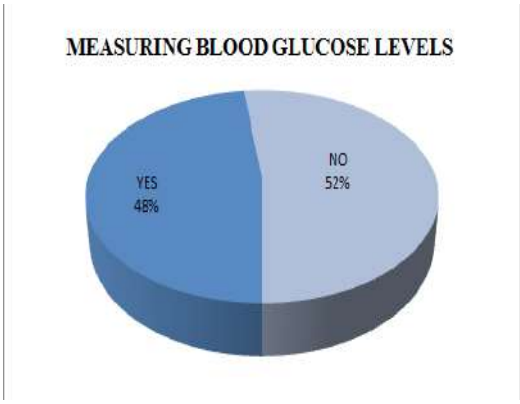
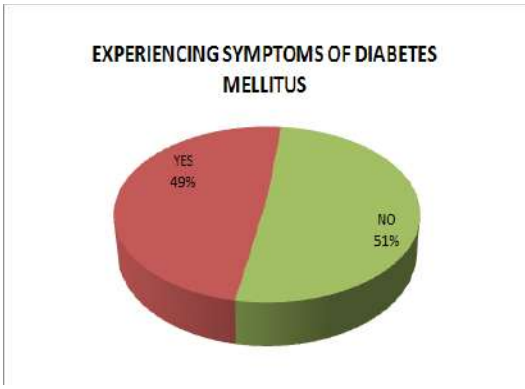
further complication of diabetes and its prevention, short of infrastructure for proper screening camps to identify diabetic screening and identification of high risk individuals are those factors which make diabetes mellitus a common disease [7]. Many young diabetics who as year's progresses live into their old age where they develop and suffer from chronic morbidity due to complications of diabetes mellitus thus forcing them to lead a life of poor quality. Many studies have identified that main step in tackling diabetes mellitus disease is only through providing knowledge to community regarding the disease, symptoms, complications, positive attitude towards control, prevention and various treatment modalities [8]. The aim of the present study is to assess the awareness about diabetes mellitus and its causes, treatment modalities, lifestyle modification and preventive measures to improve the knowledge among the population about one of the most prevalent diseases in the country.

Materials and Method

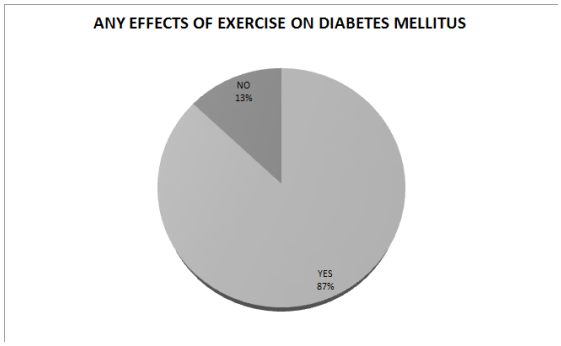
In this study, a questionnaire was formulated which mainly focussed on the general knowledge about awareness and prevention of diabetes mellitus. The sample for the study includes 100 subjects including male and females within the age group of 20 to 50 years. The questionnaire contained information like medications for diabetes, any side effects or type of medications received by them,about their consultancy with physician and at last the general details about the support and general method of control diabetes and awareness. Questionnaire was based on questions which determine the awareness and inspects the knowledge about the symptoms, diagnosis and preventive measures about Diabetes mellitus among the people. The results were tabulated and statistical analysis was done.



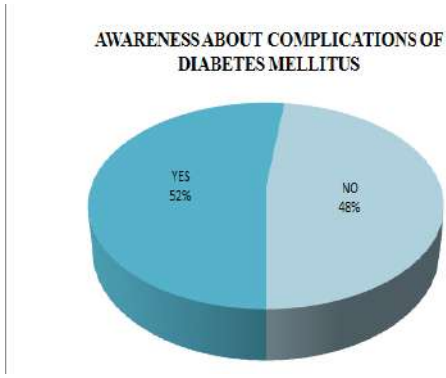
Graph 1: Population experiencing symptoms of diabetes mellitus



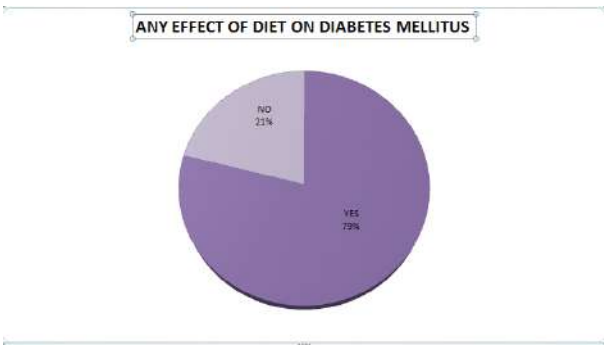
Graph 2: Population measuring blood glucose levels regularly



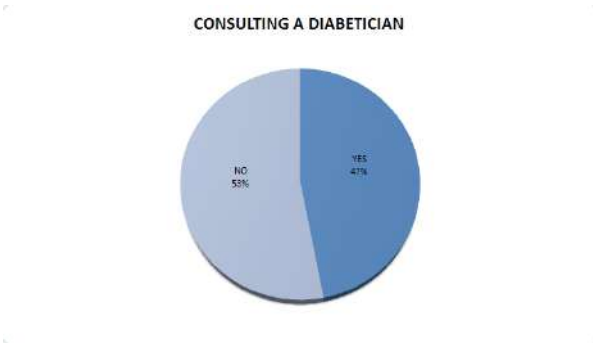
Graph 3: Population aware of effects of exercise on diabetes



Graph 4: Population having awareness about disease complications



Graph 5: Population consulting a diabetician



Graph 6: Population aware of dietary effects on diabetes

Results

From the survey, 53% of the individuals who has participated on the survey has visited the diabetes care provider in the last 12 months. 48% of the individuals do not often check their blood glucose levels and they do not have any machine to measure it.

Questions related to risk factors for diabetes revealed that misconceptions were present and worrisome fact is that only 50% of the individuals who were diabetics were aware of the risk factors and further complications.

Awareness about the complications that diabetescan lead to is there among 52% of the populations in which the individuals say that diabetes can lead to respiratory,cardiac problems and some say that it may lead to death.

Individuals were not sure that they had any confirmatory test for diabetes which is around 81% and so they were not able to answer any one of the confirmatory tests for diabetes mellitus.

Many individuals were unaware that diabetes is a disease which has two subtypes. Only 47% of the individuals were able to differentiate two types of diabetes Type 1 and Type 2[9]. Individuals have an argument that they experience changes in result when consulting one or more physician which makes them uncomfortable to discuss about the management of diabetes. This was reported by 48% of the individuals. Patients undergoing treatment for diabetes had an increased familial support for them to do so according to our results.

Discussion

The main aim of this study is to find out about the awareness and prevalence of knowledge in controlling diabetes among the individuals who were participating in this survey. A study by Deepa Mohan et al found that 75.5% of the individuals in Chennai were aware of diabetes[10]. However, the same study had revealed poorer knowledge about the complications of diabetes only 74.2% among diabetics which was similar to the results obtained from our study.

Our survey has only basic questions which tests the knowledge of individuals about the diabetes in questions like types,preventive measures,treatment options etc. Similarly another study was conducted in Singapore by Wee about public awareness on diabetes which showed low scores on general knowledge but good understanding of complications[11]. This implicatesthat majority of the patients have not been taught about diabetes by their physicians and the same results were obtained from the survey which was obtained from the study.

In this survey,there is mixed responses for the question regarding the frequent monitoring of blood glucose level. A similar study is done by Kaur and others in chandigarh where the people are poor in tooth care and infrequent monitoring of blood sugar[12].

Generally, Prevention of diabetes can be done with help of medications and other physical activities. Majority of the people who participated in the survey identified that dietary habits and physical activities can help in a greater extent to control diabetes. The prevention has an impact by reducing both the need for diabetes care and to treat diabetic complications[13].

In our survey, there is finding that comprehensive programmes, mass media, relatives, doctors can have an large impact as an important step in preventative health service which was similar to study conducted by parks in which he discussed about the social mobilisation and communication in TB control programmes[14].

The results of the study represent only the tip of the iceberg, in depth community based studies has to be undertaken to assess the awareness, about diabetes. Community level awareness programs are to be launched so as to increase the awareness about diabetes.

Conclusion

Awareness about diabetes is insufficient among the population our study and hence a dearth for proper knowledge in prevention and management of diabetes mellitus. This study is done in order to emphasise the need of increasing diabetes awareness activities in form

of campaigns or educational programmes in both urban and rural area of India in order to improve the disease outcome and prevention of the disease.

Conflict of Interest: None

Source of Funding: None

Ethical Clearance: Informed consent for patient was obtained from the patient.

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Vitamin D Deficiency in Rural Area of Gautam Buddh Nagar: An Observational Study

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Abstract

Background: In addition to bone formation, mineralization,calcium and phosphorus metabolism, vitamin D is also involved in maintaining normal neuromuscular function. Vitamin D deficiency is a public health problem in our country. Its deficiency is widely prevalent in urban population. However, rural Indian population is perceived to be at low risk of vitamin D deficiency due to their lifestyle exposing them to more sunlight.

Aim: To study the prevalence of vitamin D deficiency in rural population of Gautam Buddh Nagar district of national capital region.

Methodology: Consequent 80 apparently healthy subjects of either sex from both rural and urban background, with nonspecific symptoms were studied for their demographic profile and 25(OH) vitamin D levels.

Results:25(OH) vitamin D level was 14.96 ng/ml in rural group and 16.25 ng/ml in urban group. A high prevalence of vitamin D deficiency was observed in both rural and urban population of Gautam Buddh Nagar.

Conclusion: Vitamin D deficiency is widely prevalent in our society including rural India. Apparently healthy subjects of rural population particularly women with nonspecific symptoms should be evaluated for vitamin D deficiency.

Introduction

Vitamin D deficiency is a global problem and its deficiency is widely prevalent in urban Indian population across all age groups and sections of society[1,2,3]. In large chunk of population vitamin D deficiency is subclinical which is characterized by non specific musculoskeletal clinical manifestations[4]. However, there is limited data available about deficiency of vitamin D in rural population of our country. Factors such as low sunlight exposure, age related decrease in vitamin D synthesis in the skin, and diet low in vitamin D are the main causes of vitamin D deficiency. Physical factors like clothing, sunscreens, and glass-shielding attenuate UV-B exposure of skin and thereby, markedly reduce synthesis of vitamin D.

Population in rural areas generally has different occupation and lifestyle. In rural areas, large proportion of men and women work as farmers and are exposed to more sunlight whereas people living in urban areas generally work indoor and do not get adequate exposure to sunlight[5]. People in urban areas are also involved in activities that avoid sun light, e.g., protection from sunlight by use of umbrella and sunscreen[6,7]. On the other hand, melanin pigment, produced by melanocytes

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on exposure to sunlight absorbs UV-B rays and thus attenuates the final dose of UV-B energy reaching 7-dehydrocholesterol in basal layers of epidermis. Therefore,melanin functions as natural sunscreen and reduces the skin's ability to synthesize vitamin D as much as 99%. Therefore persons with dark skin are more likely to have vitamin D deficiency and need more direct sunlight to have optimum amount vitamin D synthesis by skin[7,8].

UV-B rays of sun trigger the photolysis of pro-vitamin D3 (7-dehydrocholesterol) to previtamin D3 in plasma membrane of keratinocytes of human skin. This plasma membrane previtamin D3 is isomerized to vitamin D at skin temperature. Serum 25(OH)vitaminD is major circulating metabolite and standard clinical measure of vitamin D status. 1, $25(OH)_2$ vitamin D should not be measured to determine vitamin D status, as it can be normal or even elevated in patients with vitamin D deficiency. Studies have shown that serum 25(OH) vitamin D level around 30 ngm/ml (75 nmol/L) induce a minimum steady state level of PTH.

Material and Method

The present study was conducted in the department of medicine, Government Institute of Medical Sciences, Greater Noida for a period of one year. Consecutive 80 patients attending medical OPD with complaints of backache, generalized bodyache, joint pain, fatigue, and muscle weakness were included in the study. Patients with history of diabetes mellitus, chronic liver disease, chronic kidney disease, thyroid disorders, malignancy, chronic diarrhea, or any other chronic illness, were excluded from the study. Patients taking vitamin D or with past history of Vitamin D supplementation were excluded from the study. Patients who were bed ridden and forced to stay indoor due to any chronic condition or otherwise were also excluded from this study. Patients were evaluated for demographic profile and serum 25(OH) vitamin D level.

Results

In the present study out of 80 subjects 38 had rural background whereas 42 subjects belonged to urban class. Out of 80 subjects 27 were male and 53 were female. In this study 34 subjects belonged to 21-40 and 41-60 year age group each, 11 subjects belonged to >60 year age group, whereas only 1 belonged to < 20 year age. Severe vitamin D deficiency was found in 25% (20/80), vitamin D deficiency was found in 48.75% (39/80) with insufficiency in 18.75% (15/80) in the study population. Sufficient vitamin D level was found in only 7.5% (6/80) cases. 25(OH) vitamin D level was 14.96 ng/ml in rural group and 16.25 ng/ml in urban group. Vitamin D deficiency in rural area was comparable to urban population and it was as common in males as in females.

Table 1: Number of subjects in both the groups

Patient Profile	Rural	Urban	Total
Male	9	18	27
Female	29	24	53
Total	38	42	80

Table 2: Average vitamin D level in ng/ml in both groups

Patient Profile	Rural	Urban
Male	12.44 ng/ml	14.38 ng/ml
Female	15.87 ng/ml	17.52 ng/ml
Total average	14.96 ng/ml	16.25 ng/ml

Table 3: Age of patients in both the groups

Age Group in Years	Rural Male	Rural Female	Urban Male	Urban Female	Total
<20	1	0	0	0	1
21-40	5	14	4	11	34
41-60	4	13	7	10	34
>60	0	1	6	4	11

Table 4: Severity of vitamin D deficiency in study groups

Vitamin D Status	25(OH) D (ng/ml)	Rural male	Rural female	Urban male	Urban female	Total
Severe deficiency	<10	2	5	7	6	20
Deficiency	10-20	5	18	7	9	39
Insufficiency	20-30	3	4	2	6	15
Adequate	30 -40	0	1	1	4	6

Discussion

India, despite being a tropical country with abundant sunshine is found to have high burden of vitamin D deficiency among the public irrespective of their socioeconomic status. *GRet. al.,* in one study reported vitamin D deficiency in epidemic proportion with a prevalence of 70-100% in general population both in urban and rural settings across all socioeconomic strata[9]. *Agarwal N et.al.*, observed in their study that vitamin D deficiency was present in 83.7% of subjects (<20 ng/ml) at baseline among Indian postmenopausal women[10]. High prevalence of vitamin D deficiency in patients with type 2 diabetes mellitus has been observed by some studies. *Selvarajan S et.al*., observed that vitamin D deficiency was prevalent among apparently healthy Indians living in different regions irrespective of their exposure to sun light[2]. *Choy EY* in one study among Korean adults observed that vitamin D deficiency peaked in summers and higher vitamin D levels were correlated with summer, the 60s age group, rural residence, moderate to vigorous physical activity, and multivitamin supplementation. He also observed that higher education and unmarried status were inversely related to vitamin D levels in both male and female[11]. Interestingly in the present study maximum number of subjects with vitamin D deficiency belonged to 20-60 years and fewer subjects belonged to above 60 years of age. The possible reason for this observation may be increasing awareness about vitamin D deficiency in the society and increasing medical attention in the form of calcium and vitamin D supplementation received by elderly people. *Roland VK et. al.*, in one study conducted on 174 patients in Switzerland observed that vitamin D deficiency was present in 71% of chronic pain patients and another 21% had insufficient vitamin D levels[12].

Conclusion

In this small study it is concluded that vitamin D deficiency is as common in rural population as in urban population of Gautam Buddh Nagar district of national capital region, although deficiency of this vitamin is more prevalent in females than in males. One of the reasons of vitamin D deficiency in rural India could be the decreased synthesis of vitamin D because of high melanin skin pigment and reduced intake of dietary products rich in vitamin D. Therefore apparently healthy subjects of rural population particularly women with nonspecific symptoms of bodyache and weakness should be evaluated for vitamin D deficiency and if found so they should be supplemented with vitamin D and calcium.

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Conflict of Interest: Nil

Ethical Clearance: Taken from institutional ethical committee.

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Identifying the Status of Menstrual Hygiene Management

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Abstract

For women, the onset of puberty is marked by menstruation. To bleed is natural and indispensable essence of being a woman. However, innumerable myths and taboos perceive menstruation as a negative phenomenon and lead to pessimistic attitudes toward this biological experience and women going through it. The culture of silence around menstruation increases the perception of menstruation as something shameful that needs to be hidden, and may reinforce misunderstandings and negative attitudes toward it. Proper menstrual hygiene management is the most significant and crucial aspect of female health but has been grossly neglected not just in developing countries but across the globe.

The paper presents ground assessment of the knowledge, beliefs, and source of information regarding menstruation among the adolescent school girls and also identifies the status of menstrual hygiene among them. This study was undertaken, under the Innovation Project of Delhi University in the year 2015-16. This interdisciplinary undergraduate program had two components: Awareness generation and action oriented. Awareness generation was related to providing information through workshops about menstruation among the college going young women adolescent school girls of the secondary school. Action component was related to production of low cost sanitary napkins by using simple technology that has been locally developed.

Keywords: *Menstruation, Menstrual hygiene, Innovation Project.*

Introduction

For women, the onset of puberty is marked by menstruation. To bleed is natural and indispensable essence of being a woman. However, scores of myths and taboos continue to perceive menstruation as a negative phenomenon[1] and lead to pessimistic attitudes toward this biological experience and women going through it. The culture of 'silence' around menstruation increases the perception of menstruation as something shameful that needs to be hidden, and may reinforce misunderstandings and negative attitudes toward it[2].

Proper menstrual hygiene management is the most significant and crucial aspect of female health but has been grossly neglected not just in developing countries but across the globe. Increased knowledge and safe practices related to menstruation right from adolescence may help in diminishing the suffering of millions of women[3] (Yasmin et al: 2013).

With this background the present study was undertaken, under the Innovation Project 2015-16, to assess the knowledge, beliefs, and source of information regarding menstruation among the adolescent school girls and also to identify the status of menstrual hygiene among them.

This interdisciplinary undergraduate program had two components: Awareness generation and action oriented. Action component was related to production of low cost sanitary napkins by using simple technology that has been locally developed.

Awareness Generation Component: Awareness generation was related to providing information through workshops about menstruation among the adolescent school girls of the secondary school. It was based on the hypothesis that awareness generation and promotion of low cost technologies can play a vital role in combating the harmful consequences of menstrual hygiene mismanagement. The objectives were as followed

i. Developing an acquaintance in girls with the subject of menstrual hygiene mismanagement,

ii. Understanding on traditional practices during menstruation.

iii. Myths related to menstruation.

iv. Unhygienic practices and their health impacts.

v. Management of menstrual waste.

vi. Products to be used during menstruation.

vii. To encourage low cost sanitation technologies

viii. To generate acceptability in community for handmade sanitary materials,

ix. To develop a mechanism within the institutions with the help of trained population groups for production and sale of sanitary pads.

The study focussed on assessing the knowledge, beliefs, and source of information regarding menstruation among adolescent school girls and also to identify the status of menstrual hygiene among them. The purpose of the project was awareness generation, facilitation of information and training on handmade sanitary napkins.

From the review of literature it was clear that many times social taboo[4,5,6,7,8]and unhelpful outlook of parents and teachers in discussing the issues related to menstruation have obstructed the access of adolescent girls to the proper information about the entire phenomenon[9]. After a survey of Government primary and secondary schools near Chandrawal area in North Delhi and series of interaction with several NGOs, individuals and school authorities the team prepared a list of eight schools which could be approached for the study. An informal visit to each school was made and the purpose of study was explained. Most of the Principals and teachers welcomed the idea. However, one of the Principals was totally apprehensive about the interaction with the students. She insisted that open discussions about 'such things' leave the growing up girls more confused.

After the informal interaction, the investigators approached Deputy Director of Education (North District) with a request for holding Awareness Workshop on Menstrual Health and Hygiene among students of class 6^{th}, 7^{th}, 8^{th},and 9^{th} standard in four Government Girls Secondary Schools of North Delhi. With her consent, the team held awareness workshops and conducted focus group discussions with the girl students of the selected schools.

Method of data collection: The basic method for collecting data on the awareness levels among the target groups were direct personal observation supplemented by interviews and focus group discussions. It was supplemented by series of workshops and interactive sessions on menstrual hygiene management.

For the Innovation Project team, there were series of sessions on sanitary pad preparation. It began with familiarizing the participants with the materials and then involving them in the production. The team also interacted with a number of civil society organizations working in this field.

Sampling and development of structured Interview Schedule: A random selection of 400 girl students from four Government Girls Secondary Schools of North Delhi (100 from each school) was done for the data collection.

Data was collected on the structured interview schedule so that it could be comparable in all respects. For this purpose items were framed following scientific procedures of item writing and discussion with a number of experts from social work and education background. On the basis of the suggestions the schedule was finalized which contained the following areas:

Demographic Characteristics, Information about Menstruation, Knowledge and Perception regarding Menstruation, Practice of Menstrual Hygiene, and Restrictions practiced during Menstruation.

This schedule was earlier administered on a small sample of students of Lakshmibai College to see if language was suitable for the population.

Interview and Focus Group Discussion: A pre-designed pre-tested structured interview schedule was eventually administered on a sample of 400 schools going girls specified in the study as per the sampling design. They were explained about the purpose of the study and were assured of confidentiality. A verbal consent was obtained from the girls before administering the questionnaire which included questions regarding the knowledge about menstruation, the source of information and practices followed to maintain menstrual hygiene. Investigators instructed on how to fill the schedule and adequate time was given to fill up the same. Any difficulties in answering the schedule were sorted out by the investigators.

At the end of the data collection a FGD was conducted with girls of different age groups. The discussion was

focussed on the normal physiology of menstruation, the importance of maintaining hygiene and safe hygienic practices during menstruation. Questions and concerns of the participants were also addressed at the end of the session.

Result and Discussion

As explained above, the interview schedule was divided into five sections. The aim was to understand the perception, experience and information about menstruation.

Menarche becomes a significant experience in girls at the threshold of adolescence[10]. The age of the respondents ranged between 10 to 13 years. 87.25% of the respondents were aged between 11 to 12 years. One of the items of the schedule sought information on the source of information about menarche. Mostly, mothers are the main informants as well as confidant of the girls at this age. However, there is always an element of concern as to how the girls are informed about this phenomenal change in their bodies. Out of 400 respondents 336 replied that mothers were the first informants for them. It was followed by friends/sister (35), teacher/health worker (20). Amongst other options, television was an important source of information about menstrual hygiene (9).

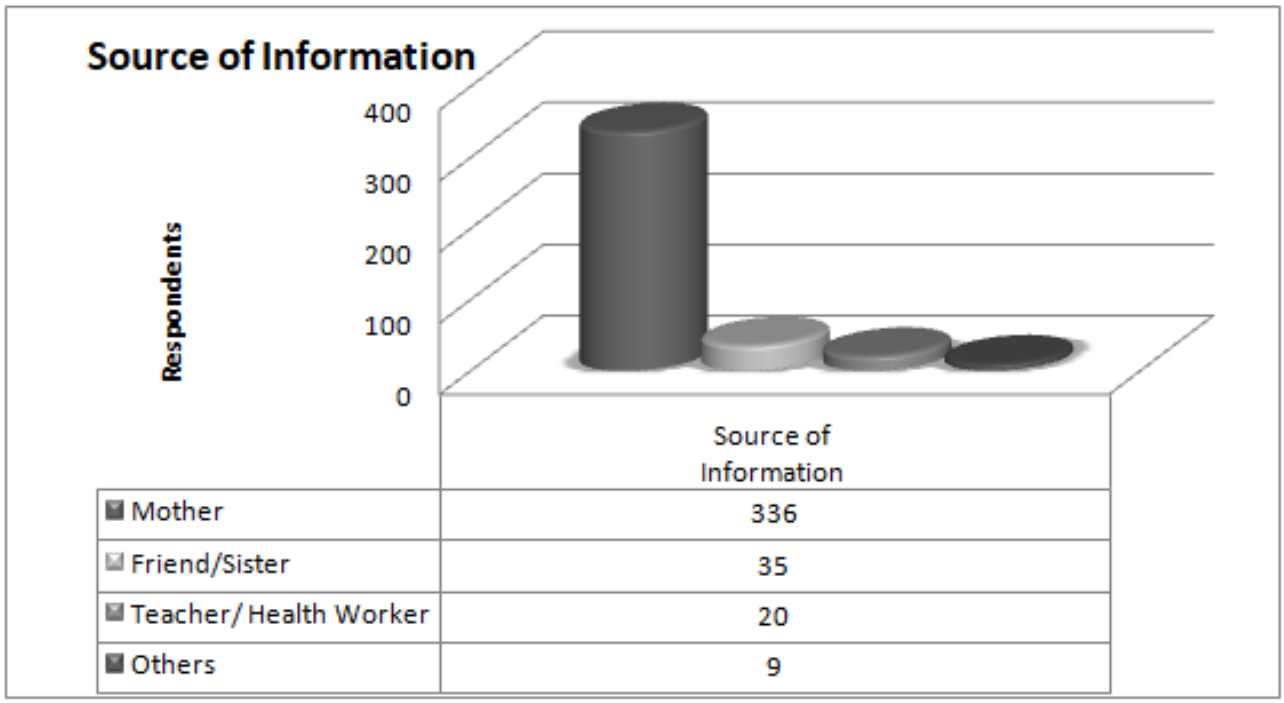

Figure 1

Awareness regarding menarche and menstruation among respondents before attaining menarche was found to be low. Out of 400 respondents, 252 knew about it after menarche. After reaching puberty, girls are faced with challenges related to menstruation. Lack of information, misconceptions and adverse attitudes to this natural process have lead to a negative self-image among girls. This often results in a lack of self-esteem as they mature as women. Most often this emotion, the negative self-image, grips them with the onset offirst 'period'. It was interesting to talk to girls about their first period and how they felt about it. When asked about the cause of menstruation, 61% of the respondents believed it to be a physiological process. It was interesting however to note that 9.5% of the total respondents believed it to be some kind of curse. 27% of the respondents had no idea about the cause of menstruation.

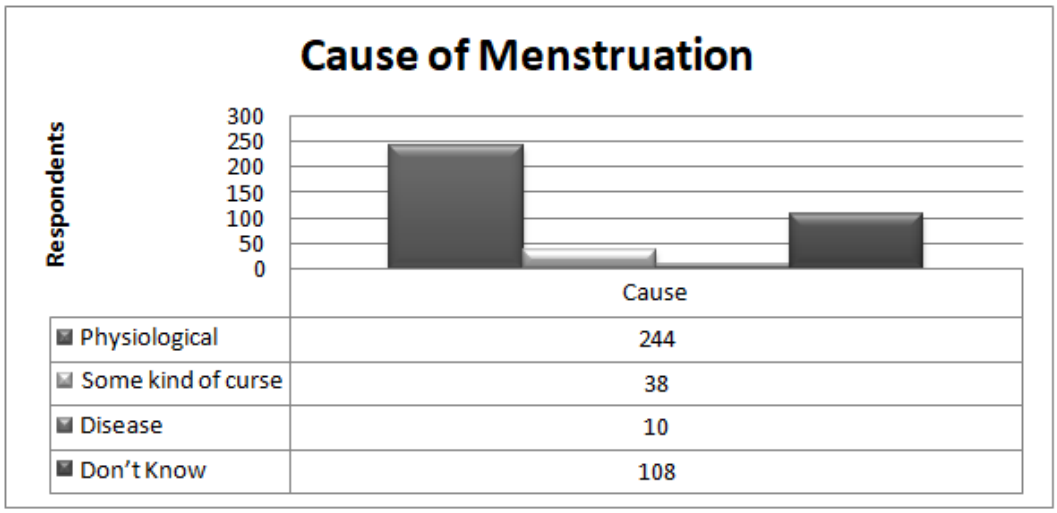

Figure 2

Awareness level was quite low about where the menstrual bleeding originated from. 68% of the respondents had no idea about it. There were three other items in this section that showed lack of awareness about menstruation and menstrual health.

The next section of the schedule tried to understand the common practices of menstrual hygiene. The type of absorbent material used was of primary concern. The reuse of any absorbent material, most commonly, cloth, could be a cause for infection if it was not properly cleaned dried and stored. This study revealed that girls both cloth and sanitary pads as absorbent during menstruation depending on the availability.

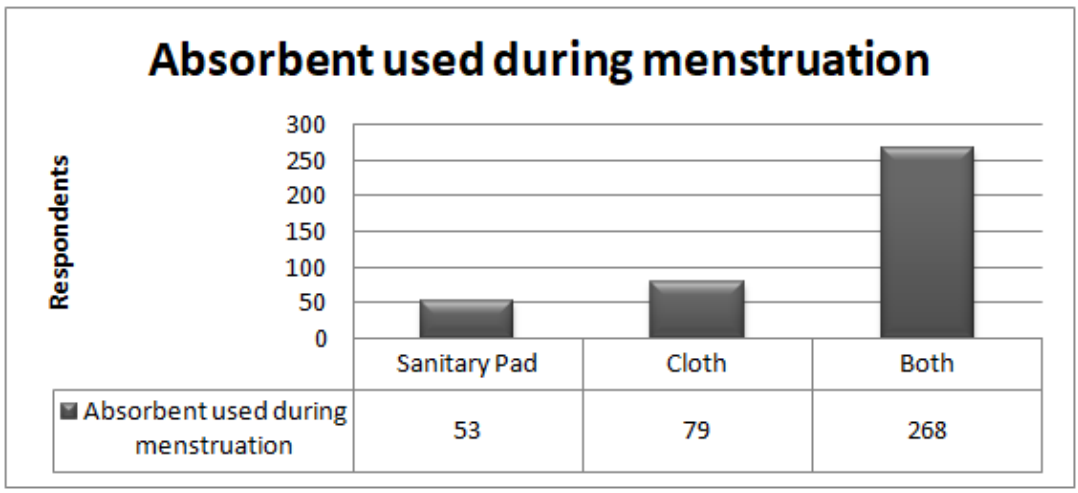

Figure 3

However, some of the girls informed that they preferred cloth pieces rather than sanitary pads as menstrual absorbent because they did not have proper undergarments to support it. Some of the teachers shared their concern that due to lack of proper undergarments the girls did not attend school during those days. It was also suggested that provision of undergarments and sanitary pads at low cost might increase the use of sanitary pads.

The place of storage of the cloth or napkins was equally important for cleanliness and hygiene. The practice of storing them was not witnessed. They procured cloth or pads as and when required.

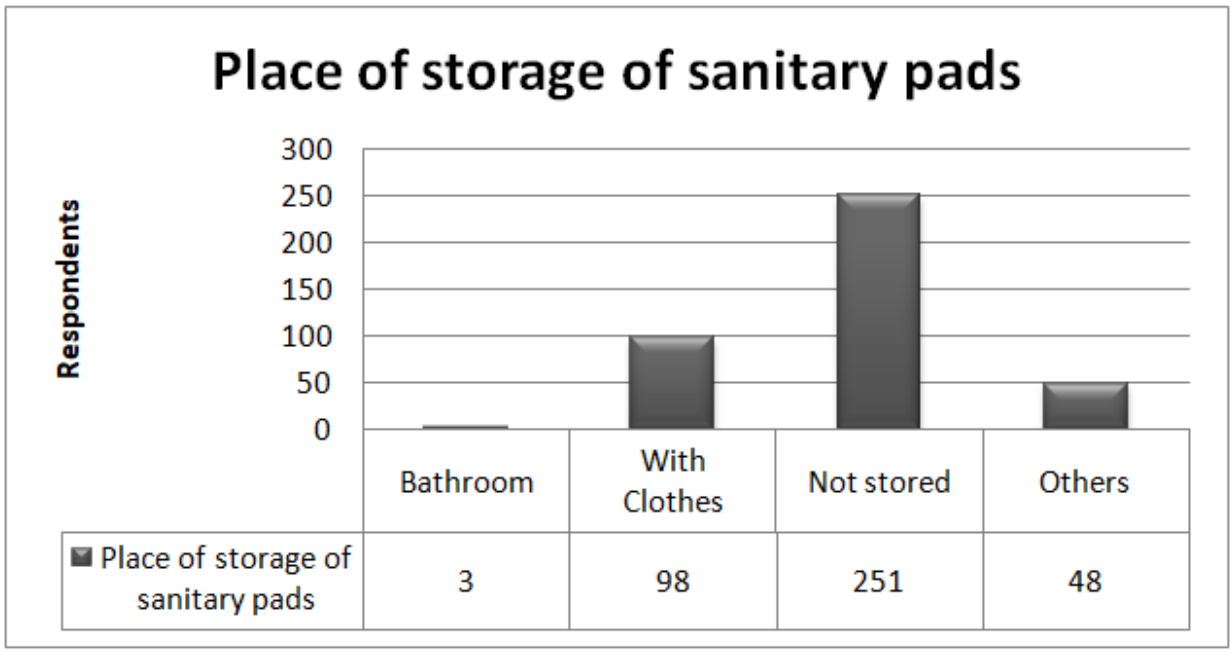

Figure 4

The proportion of the participants who used the bathroom as a storage place was very low.

In the present study, the most common method of disposal of the used absorbent was wrapping it in paper and disposing it in routine dustbin which was used for solid waste disposal. However, 32% of the respondents admitted to throwing the sanitary waste on the roadside as it got dark.

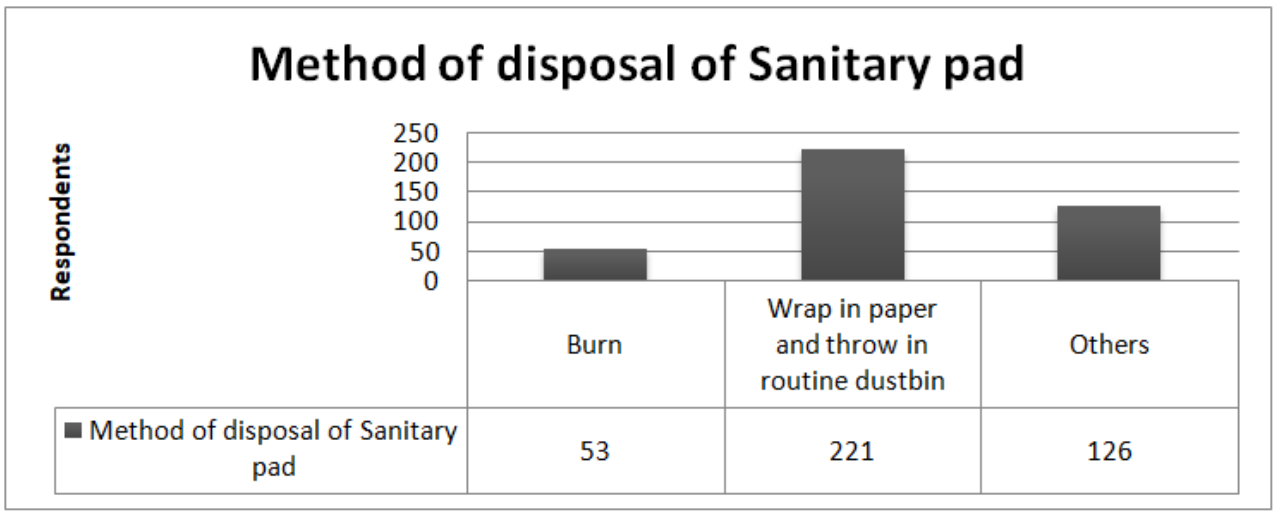

Figure 5

In the present study restrictions were practiced by most of the girls, visit to holy places and touching stored food being the most common restrictions.

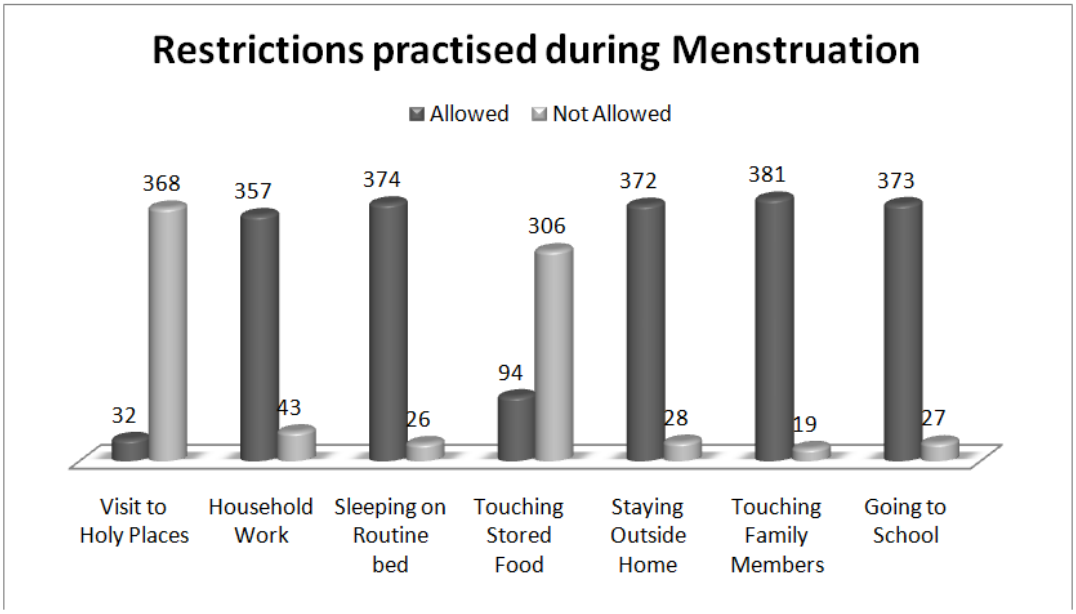

Figure 6

Considering the limitations of this study in terms of sampling method, additional studies may be needed using a wider geographic scope, in order to produce sufficient and comprehensive results.

Action Component: The College provided for an Innovation Room where the project team has produced Sanitary napkins at low cost. The production of the napkins has been done entirely by the college students (a team of ten students selected for the project).

Innovation shown and its future impact: Contemporary political thinker, Nancy Fraser[11] opines that, "institutionalized patterns of cultural value constitute some actors as inferior, excluded, wholly other, or simply invisible, hence as less than full partners in social interaction, then we should speak of misrecognition and status subordination"(p.29). Both these cultural constructs are visible when one places women and the world face to face.

Sciences rightly have the first claim to inventions and discoveries. The Social Sciences keep exploring the continuity and change within the society which makes every stratum significant.

As members of academics, it becomes one's responsibility to take such issues to the ground using awareness and information as the working tools. The innovative techniques have evolved within the country that enhances easy and low cost access to something as essential as sanitary napkins.

This project has wide social contribution as well as commercial implication.

Conclusion and Future direction

Menstrual hygiene is an issue that is quite unsatisfactorily acknowledged. It has not received ample attention in the reproductive health and Water, Sanitation and Hygiene (WASH) sectors in developing countries including India[12]. Its connection with and effect on achieving many Millennium Development Goals (MDGs) is hardly ever recognized[13].

This study has tried to tackle several issues at the ground level. The low and lower middle class strata more often than not lack knowledge as well as money for availing basic necessities as sanitary napkins. Females mostly use old and dirty clothes due to their impoverished background. They do not know how to manage menstruation properly. It can lead to extreme forms of infections and diseases. The introduction of the concept of handmade sanitary material to the school students, teachers, college youth and other sections of the society eventually would at least help in addressing the basic health issues.

Ethical Clearance: Taken

Source of Funding: Research Council, University of Delhi provided the grant for undertaking this Innovation Project in the year 2015-16.

Conflict of Interest: Nil

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Effect of Strengthening of Scapular Stabilizers in Treatment of Rounded Shoulder Posture in Dental Students

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Abstract

Objective: The objective of this study was to investigate the effects of scapular stabilizer strengthening in rounded shoulder posture in male dental students.

Method: Ethical clearance was obtained from the institutional ethical committee. Total 30 Subjects were selected as per the inclusion criteria and rests were excluded. Participants were informed about the study & written consent was taken prior to participation. In pre test assessment, subjects were assessed by scapular index. They were given strengthening exercises of scapular stabilizers as a treatment of rounded shoulder posture before they start working for 30 minutes per day, 5 days a week and were continued for 4 weeks. Post test assessment was done by using same outcome measure. Interpretation of the study was done on the basis of comparing pre test and post test assessment. Thus, the study was concluded with the help of statistical analysis by using paired 't' test.

Results: The study showed effect of strengthening of scapular stabilizers on rounded shoulder posture in dental students is ($p>0.0001$), which is extremely significant.

Conclusion: On the basis of the results of our study, it is concluded that strengthening of scapular stabilizersis extremely significant effective in correcting rounded shoulder posture among male dental students.

Keywords: *Rounded shoulder, external rotation, scapular stabilizers.*

Introduction

Rounded shoulder posture is characterized by acromion protraction in front of the line of gravity, shoulder protraction and downward rotation as well as anterior tilt[1]. According to previous study rounded shoulder is described as abduction and elevation of the scapula and a forward position of the shoulders which gives appearance of a hollow chest[2]. Posture and comparative alignment of the body is affected due to shortening and weakness of the muscles. rounded shoulder posture deform the normal relationship of the muscles and the bony structures which are correlated to each other[3]. It is described as a result of shoulders being pulled forward by over-developed, shortened or tight anterior shoulder girdle muscles such as serratus anterior, upper trapezius etc.[4, 5] Additionally, it may also caused by weakness and lengthening of the upper and middle trapezius muscle that function to pull the scapulae toward spine[1].

It has been also documented in factors which are contributing to head, shoulder as well as neck pain[6]. Trapezius and lower serratus anterior act as the prime movers for scapular upward rotation. Rhomboids and levator scapulae are downward rotators and serratus anterior, rhomboids, trapezius, levator scapulae are stabilizers of scapula[7]. Position and control of the scapula on thorax, play a critical role in the normal function of the shoulder. While doing overhead activities periscapular muscles provide stability and help in pain free mobility at shoulder complex in healthy individuals[8].

Although many technical advances have arrived in recent years, many occupational health problems

still persists in modern dentistry [9].Musculoskeletal disorders are common problem in dentists as its incidence is 63 to 93%.Some of these musculoskeletal disorders may recognized to postural abnormalities or poor posture specifically in demanding jobs such as dentistry. Prevalence of rounded shoulder posture in dentists contributes to 68.8% [10]. There are some factors which may play important role in pathogenesis and constant complaints are prolonged static and dynamic awkward postures and repetitive movements, physical conditioning [11]. Previous studies have acknowledged that these postural problems may considerably influence the social life and result in diminished working efficacy and early retirement in dentistry [12, 13].

It is found in early studies that, Stretching, McKenzie and Kendall exercises for shoulder girdle muscles are commonly used in the treatment of shoulder dysfunctions and correction of posture [1]. However there is limited research available to show any significant impact of strengthening of scapular stabilizers in treatment of rounded shoulder posture in dental students.

Strengthening exercises are defined as a systematic procedure of a muscle or muscle group lifting, lowering or controlling resistance for a relatively low number of repetitions or over a short period of time [14].These types of exercises can be performed in both closed chain as well as open chain positions. Exercise interventions aimed at strengthening of the weak that is scapular stabilizing muscles [15].The purpose of this study was to evaluate the effect of 4 weeks of strength training on rounded shoulder posture by scapular index as outcome measure. For assessing rounded shoulders, scapular index was used [16].

Method

Ethical clearance was obtained from the institutional ethical committee. Total 30 Subjects were selected as per the inclusion criteria and rest were excluded. Participants were informed about the study & written consent was taken prior to participation. In pre test assessment, subjects were assessed by scapular index. They were given strengthening of scapular stabilizers as a treatment of rounded shoulder posture before they start working. The exercises were given for 30 minutes per day, 5 days a week and was continued for 4 weeks.

Post test assessment was done by using same outcome measure. Interpretation of the study was done on the basis of comparing pre test and post test assessment. Thus, the study was concluded with the help of statistical analysis.

Sampling method: convenient sampling

Treatment

Exercise protocol for activation of scapular stabilizers:

1. Side lying external rotation with elbow 90° flexion using dumbbell.
2. Side lying external rotation with forward flexion using dumbbell.
3. Prone horizontal abduction at 90° with full external rotation using dumbbell.
4. Prone external rotation at 90° abduction and elbow at 90° using dumbbell.
5. Shoulder shrug at 0° abduction.
6. Shoulder shrug at 30° abduction.
7. Standing wall shrugs.

All the exercises were performed 30 minutes/day for 5 days/week for continuous 4 weeks.

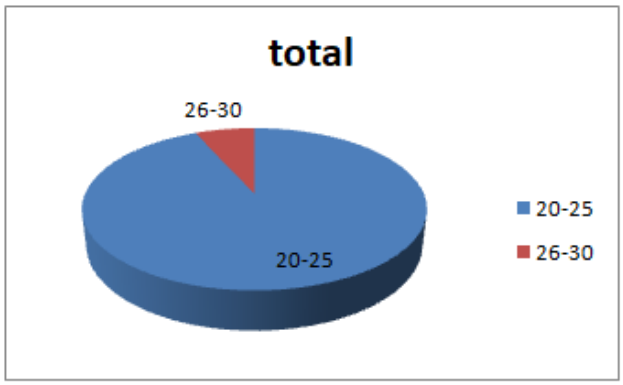
Strengthening exercises of scapular Stabilizers:

1. Scapular retraction against handheld resistance in prone
2. T to Y to W exercises
3. Scapular-clock exercise on the table
4. Scapular-clock exercises on a wall
5. Corner press-out

Subject Criteria: Total of 30 subjects, male interns and male PG dental students working more than 5 hours were selected in the study. They were aged between 20 to years. The explanations about the study procedure were given. The outcome measure was scapular index. The subjects who were not included in the study were dental students having history of diagnosed rheumatoid disorders,history of any neurological disorders,Female dental students,Trauma as well as surgery in shoulders and spine.

Results

1. Age Distribution in this Study:



Graph No. 01: Age distribution

Interpretation: This graph shows that, the age distribution in this study included is 28 in age group between 20-25 and 2 in 26-30 age group.

2. Pre and Post Comparison:

Table No. 01

Scapular Index	Pre	Post
	70.733	72.917

Chart: Pre and Post Comparison

Table No. 02

Group	PRE	POST	P value	t value	Remark
Scapular Index	70.733±2.337	72.917±2.567	<0.0001	8.297	Extremely Significant

Statistical Analysis: The outcome measure was assessed at the baseline. The collected data in this study was statistically analyzed using descriptive statistics as mean, standard deviation and percentage. The scapular index was analyzed by paired t' test. T values were calculated in the scapular index. Statistical significance was accepted for the values of ($p < 0.0001$).

Discussion

There are many technical advances arrived nowadays still many occupational health problems persists in dentists[9]. Musculoskeletal disorders are common problem in dentists as its incidence is 63 to 93%. Prevalence of rounded shoulder posture in dentists contributes to 68.8%[10]. A variety of factors which may contribute important role in pathogenesis and constant complaints are prolonged static and dynamic awkward postures and repetitive movements, physical conditioning [11].

In the current study, dental students between age group 20-30 fulfilling the inclusion criteria were included. Dental students working for more than 5 hours were included in this study.

The aim of our study was to find out the dental students having rounded shoulders and to strengthen their scapular stabilizers. Statistically the present study showed that there were significant changes in the outcome measure with significant difference seen in rounded shoulder posture mean difference (-2.183)(p value <0.0001).In our study we analyzed that the changes in scapular index,after incorporating strengthening exercises for rounded shoulder posture for 4 weeks were significant.

A study conducted to investigate the specific effects of a McKenzie exercises, Kendall exercises, self stretch exercises on rounded shoulder posture and forward head posture. In this study, rounded shoulder posture was measured by scapular index in which they found no significant differences between the groups ($p>0.05$)[1].

A study performed on intramuscular activation of scapular stabilizing muscles during push up plus and proprioceptive neuromuscular exercises. The proprioceptive neuromuscular exercises showed statistically significant higher level of lower trapezius and lower serratus anterior activities than push up plus exercises[7].

A study was done on the review of the exercises that produce optimal muscle ratios of the scapular stabilizers

on normal shoulder which included optimal positions and exercises for periscapular stability exercises. A conclusion that standing exercises tend to activate the upper trapezius at higher ratio,especially during 60-120^0 range[8].

At the end of 4 weeks in our study,it was seen that there were statistically significant difference between pre interventional and post interventional values of scapular index in rounded shoulder posture of male dental students after applying paired 't' test, concluding that there is a positive effect of strengthening of scapular stabilizers on rounded shoulder posture in dental students.

Conclusion

On the basis of the results of our study, it is concluded that strengthening of scapular stabilizersis extremely significant effective in correcting rounded shoulder posture among male dental students.

Conflicts of Interest: The authors declare that there are no conflicts of interest concerning the content of the present study.

Source of Funding: Self

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Elder Abuse in Indian Setting–A Misconception or a Reality– A Deductive Analysis

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Abstract

Background: Elderabuse has come to the limelight only since the past decade. WHO estimates that 15.7% of individuals above 60 years undergo abuse in various forms and is proposed to increase in the coming years owing to ageing population in many countries. Hence this study attempts to find out the perception of individuals towards elder abuse.

Method: A qualitative study was done by conducting Focussed group discussions (FGDs) amongst elders and those between 18–60 years of age. The discussion was audio taped and scribed which was then analysed by deductive thematic analysis. The findings have been presented based on the themes that emerged along with verbatim.

Results: The study groups were of the consensus that elder abuse is prevalent in our country. Themes that emerged were: 1) Elders are considered a burden in the society, 2) Sons and daughter in laws abuse elders more, 3) Elderly females are abused more than elderly males. The discussions also revealed a low level of knowledge amongst the groups regarding helplines for elderly/schemes for the elderly in our country.

Conclusion: Elderly abuse though prevalent in our societies lay hidden mostly because complaint registrations of such instances are very few owing to the fact that elders are dependent and are not aware of where and how to seek help.

Keywords: *Elderly, abuse, deductive analysis, FGD, Misconception, Qualitative study.*

Introduction

Though Domestic violence and Child abuse and gender-based violence have been receiving considerable attention, Elder abuse has come to the foray only since the past decade. Based on available evidence, WHO estimates that 15.7% of people 60 years and older are subjected to abuse.[1] These are likely to be underestimates as many cases of elder abuse are not reported.

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Elder abuse can be defined as "a single, or repeated act, or lack of appropriate action, occurring within any relationship where there is an expectation of trust which causes harm or distress to an older person".[1] Elder abuse can take various forms such as financial, physical, psychological and sexual. It can also be the result of intentional or unintentional neglect.

Globally the number of people affected are predicted to increase as many countries are experiencing rapidly ageing populations. While in India, 8 percent of its population was recorded 60 years and above in 2011 Census, it is expected to increase its share to 12.5 percent and 20 percent by 2026 and 2050 respectively.[2] With this kind of an ageing scenario, there is pressure on all aspects of care for the older persons–be it financial, health or shelter.

Studies have also shown that the phenomenon of elder abuse has been considered a social taboo by many and people struggle to discuss such a sensitive issue and report elder mistreatment.[3] Family members have been the most common perpetrators of elder abuse.[4,5]

Survey conducted by Help Age India in 23 cities in 2018 revealed that 60% of adults confirmed that elder abuse is prevalent in the society. 25% confirmed to being victims of the abuse as well. Elder Abuse was reported maximum in Mangalore, Ahmedabad, Bhopal, Amritsar, Delhi and Kanpur. It was least in Jammu, Mumbai, Vizag, Kochi, Guwahati.[2]

Hence this study tries to find out situation of elders through perceptions and views about the same from representative populations in Mangalore.

Objective:

1. To assess perception regarding elder abuse amongst the elders in selected urban field practice area in Mangalore
2. To assess perception regarding elder abuse amongst the General population in selected urban field practice area in Mangalore

Methodology

Study site: Urban field practice area of A J Institute of Medical Science and Research Centre

Study duration: Study was conducted over a period of 2 months (October–November 2018)

Study participants: Elderly individuals (>/= 60 years)

Individuals from the general population (> 18 years and < 60 years)

Individuals consenting to participate were included in the study. Those individuals with debilitating diseases were excluded considering that the FGDs were conducted at the health centre.

For assessing the perceptions regarding elder abuse focussed group discussions were carried out at health centre of urban field practice area of AJIMS & RC. Study subjects were recruited from the said area. Discussion was based on the FGD guide prepared after a literature review,whichwas also validated. The FGDs were continued till repetitive answers were obtained from consecutive groups. With this method we collected information from 2 groups of Elderly (> 60 years) having 5 and 6 members each and 2 groups from general population group (> or = 18 yrs - <60 years) having 4 and 5 members each. Hence a total of 4 FGD sessions were conducted. Each session lasted for 45 minutes. It comprised of a moderator who was the principle investigator of the study, a scribe to note down the verbal discussions during the FGD as well as audio taping of the entire session. The recruited participants were explained about the purpose of the study and informed consent was obtained from each of them. Themes that emerged from the discussions have been analysed using deductive analysis and the same has been reproduced in the results along with the verbatims of the participants.

Areas discussed were

1. Elder abuse in our country
2. Elders are considered a burden in our society
3. Elder abuse and financial status are related
4. Elder abuse is related to gender of the individual
5. Elder abuse is done by people whom you know
6. Helplines and Schemes for the elderly
7. Elder abuse is a punishable offence
8. Personal experience regarding elder abuse

Results

Elder abuse: Most of the elders concluded that elder abuse is a phenomenon where elders are not cared for. “Elder abuse is something where the elders are not looked after well.” All of them agreed to the fact that elder abuse is prevalent in our country. Though they were not aware of geographical areas where elder abuse is present at a high rate, they did say that Mangalore is a city where elder abuse is present. When asked regarding the situation outside Mangalore they said that did hear it through media. “These days one gets to hear of such things on television and also in newspapers.” There were a few elders who also said that their children cared for them well. The youngsters also opined that elder abuse is happening in many ways “we read in newspapers that elders get beaten up at their homes. Some of these incidents come out in the open while some others don’t as the elders do not complain of the same”.“Abuse is happening in many ways. Especially when it concerns family property matters, relatives too abuse them, and since they have grown old, they feel helpless.” “Some elders even get kicked out of their homes.” All

participants felt that elder abuse is a heinous act, but such instances should not happen as reciprocating the love and affection towards elders is but the duty of their children. 3 of the total 11 elders from the elderly group had experienced verbal abuse and neglect. "These days they don't even ask if we need a drop even to the hospital when we are sick."

Elders are a burden: Many elders confirmed that children these days consider elders to be a burden. "At this age we cannot earn. So, we become a burden to them." One elderly male stated "When I used to earn, I was looked after at home. Now that I have stopped earning since the last 1 year, I must end up begging for money even for bus charges. That is my state currently. Plus, ill health adds to the situation." They were also of the opinion that in some families children prefer that their parents stay in old age homes. "These days expenses have increased. So, when there are members in the family who do not contribute to the finances, they become a burden." "If the elders are financially better off, they are looked after well. If not, then they get treated badly." Both the elders and the youngsters felt that sometimes even if the elders have money or property then it adds to elder abuse since children start bargaining over their property share and pressurize the elders. Some of the younsters commented saying "Elders are not a burden. Their presence gives us happiness. They give us blessings. They have seen much more of life and their experience and advice can solve a lot of our problems."

Sons and daughters in law abuse elders: "It is the sons who abuse their parents more." "Previously the daughter in laws would be abused. These days it is the other way around. The daughter in law abuses the elders at home." A participant from the younger group mentioned that "when I am not at home my wife treats my mother differently." One of the elders also stated that "for me the abuse is not only at home by my son but also by the neighbours. Neighbours create lot of trouble". Some of them also opined that son in laws tend to abuse more since they have a good hold in the household matters. One of the youngsters said, "in the neighbourhood there was family where the elder daughter used to hit her mother who was later 'sent to the sons house where, the daughter in law started hitting her and then would close her in a bathroom and deprive the elderly lady of food."Some also said"We cannot tell who does the abuse, most times it depends on the bread earner and decision maker in the family."

Elder females are abused more: Most of the elders felt it is the elder females who are abused more. They said "the females stay at home mostly. And the daughters in law abuse their mother in law". The younger group similarly opined saying "the mother in law would not like the daughter in law and later the daughter in law would care less for the elderly female." Some believed "since the males no longer earn after a certain age, they undergo abuse more. The mothers are looked after while the fathers are cared less." Some participants from both groups felt that "abuse is same for both, be it males or females, when there is a financial burden no one sees if it a male or a female."

The discussions also showed that neither the elders not the youngsters knew about any helplines for the elderly. The youngsters however believed that the perpetrators need to be punished. However, one elderly stated that "whatever neglect we face we will have to continue living with them."

Discussion

Our FGD revealed that elderly females are at a higher risk of being abused as compared to males which has been similarly reported in other studies[6,7] as well. In a male dominated society, females generally are more at risk since they are more vulnerable than the rest. The common forms of abuse discussed were verbal abuse and neglect which is also seen in other studies.[6,7,8]The elderly are often a marginalized sect who are dependent financially and emotionally on others especially their family for support. These factorspose them at a risk for abuse from their close family, relatives and many a times even the neighbours.

This study has its findings in line with other studies[2,7] where sons have been commonly implicated as main perpetrators of abuse over elder individuals. This may be because sons continue to stay with their parents and later take over the responsibility of the household. But the finding is ironic that in a country like India where a male child is preferred over the female child at birth, the same male offspring is later implicated in elder abuse by most elder individuals.

It has also been seen in our study that though there are certain personal experiences of abuse there has been no complaint whatsoever registered against the crime which also goes to show that the elders are irrevocably dependent on their children and others that they either do not want such incidents to come to the limelight fearing

retaliation or they just simply ignore the incidents as a part and parcel of growing old.

Conclusion

The study shows that though not much about the elder abuse gets reported it continues to happen behind the closed doors of households. Financial reasons being the most common factor behind the abuse, it is a matter of great concern as well a matter for action in the light of facing an ageing population in the coming years.

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Conflict of Interest: None declared

Ethical Clearance: Obtained from institutional ethical committee, A J Institute of Medical Science and Research Centre, Mangaluru.

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A Study on Women Entrepreneurs Dealing Through Stress

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Abstract

Modern living is occupied of stress. Stress is an unavoidable consequence of socio-economic intricacy and to some extent, its stimulant as well. Even as stress is foreseeable in today's complex life, it is essential for individual life. When a women entrepreneur's gains practice and self-assurance in her work, the stress is leap to turn down. The proficient women entrepreneurs are found to suffer greatest extent of stress. Numerous aspects contribute for the escalating stress level of these women entrepreneurs and an effort is made in this study to analyze such contributory factors.

Keywords: *Women entrepreneurs, stress, entrepreneurial constraints.*

Introduction

Women entrepreneurs play a very important role in generating employment to others in the well-organized segments and place the drift for other women entrepreneurs to grow[1]. The participation and progress of women entrepreneurs is now very much evident in India. Entrepreneur being women have to carry out and keep up a sense of balance among several responsibilities and its concern obligations. It is eminent that women entrepreneurs were suffering from role divergence i.e. one had to concurrently be a mother, a wife and a boss and this put forth's a lot of mental stress and strain[2].

Stress: Stress grounds a commotion in the emotional firmness of an individual that brings about a state of ineffectiveness in the personality and conduct[3]. It is well thought-out to be an internal state or response to anything actual or imagined that an individual deliberately or instinctively perceives as a threat [4].

Women Entrepreneurs: The women entrepreneurs create new jobs for themselves and also for others and render a great service to the society[5]. Women Entrepreneurs may be defined as the woman or group of women who initiate, organize and co-operate a business enterprise

Entrepreneurs' stress: Entrepreneurial position stress can be described as the detrimental physical and emotional responses that take place when the necessities of the enterprise or job do now not in shape the capabilities, resources, or needs of the entrepreneurs[6]. The stress of the women entrepreneurs will be decreased based on their work knowledge, experience and confidence in the work [7]. Every entrepreneur deal with some problems and the most unpleasant part is that women entrepreneurs were greatly encountered by plentiful difficulties and obstacles than men.

Problems faced by women entrepreneurs: Women entrepreneurs stumble upon a problem such as an inadequate training, financial strain and family errands, worked time is not measured with respective wages, the rate of struggling to go on in the market is high, and certain entrepreneurs have not even used the internet in their business [8]. Women entrepreneurs endure various personal problems like the absence of business contact, the lack of adequate experience and suspicious attitude towards risk. They also face certain familiar social problems like family responsibilities, unwritten rules of society, and male supremacy, no possession of properties, the lack of economic power, depending on male members on banking and few economic related issues[9].

Stress faced by women entrepreneurs: Compared to the other occupation categories women entrepreneurs sense more stress in their profession [3]. The role related stress experienced by the women Entrepreneurs can be characterized into three major magnitude, role

overload, role conflict and role ambiguity [10]. Women entrepreneurs experience role stress in performing twin responsibilities [2]

Constraints faced by women entrepreneurs: It is observed that women entrepreneurs were facing many constraints in running an enterprise[11] as follows.

Knowledge associated: Women entrepreneurs are in general not conscious of whom to contact when there is a need. The sources which they have contact with are on the whole did not endow with full knowledge and sometimes even exploit them. Most of the women entrepreneurs lack knowledge in many financial activities. They also lack knowledge in practice and advancement in technology. They are not alert concerning the loans and the financial schemes offered for the entrepreneurs. They does not seize any economic credibility too.

Man Power: The success of an endeavour is for the most part rely on the hands of skilled labour. Many women entrepreneurs find difficulty in reaching cooperation from the male employees. At times, they were being dominated by the male employees and they were not ready to accept a woman as boss and attempt to show non co-operative approach.

Raw Material: According to the demands and choice of customer's diligent selection of raw material is important. It is one of the important spot to be determined and if it is not properly scrutinized there may be immense interruption in production process. Selecting a trustful supply agency is yet another intricate task. Determining the prices of raw material is an additional constraint.

Marketing: For any venture, competition is a great challenge. As many of the women entrepreneurs have not attended any training programme, lack of business education and knowledge make them ignorant of the marketing strategies like market segmentation, market positioning and marketing mix strategy, hence the survival of the business against the competition is found to be a huge constraint.

Effect of stress among women entrepreneurs: Stress among the women entrepreneurs generates a interruption in the emotional stability which includes a circumstances of inefficiency in the performance, personality and encompass expensive misplace for themselves, organizations and society[12], such situation have been defined as 'role novelty', which refers to an untutored characters for a precise role, which can be extended from education or experience [13].

Stress coping strategies: Stress arises when perceived strain exceeds your perceived ability to cope [14].Stress can be coped by emotional focus; it is finding a way to ease their reaction to emotional issues by giving them an emotional support. Secondly, stress coped by problem focus, it is categorising the issue and adopting a direct and constructive strategies to solve the issue[15].

Conclusion

It is necessary to involve women entrepreneurs on an equal foothold with men and this can be done only if women are given the proper means to improve themselves, and their entrepreneurial situation. The government is enchanting numerous initiatives for improving the growth of women entrepreneurs so the women who aspire to become an entrepreneur must make use of the facilities provided. Women's definitely play a major part in the economic progression. It is the responsibility of the society to facilitate every women entrepreneur to cross the obstruction such as education type, availability of fund, management skills and so forth. Women are becoming great victims to increasing stress as they are taking multi-role duties from career and home so it is the responsible of family affiliates and society to help her out to attain a balance between work and life.

Ethical Clearance: Nil

Source of Funding: Self

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Effect of Bilateral Scapular Muscles Strengthening on Dynamic Balance in Post Stroke Individuals

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Abstract

Aim: To determine the effect of bilateral strengthening of scapular muscles to improve dynamic balance in post stroke individuals.

Objectives: To find the effect of bilateral scapular muscles strengthening in stroke and to find the upper trunk balance in stroke after intervention.

Materials and Method: 42 patients were included according to Brunstrom's recovery stage 2 and voluntary control grade 2 of upper limb were randomized by chit method into two groups, group A (conventional Physiotherapy{PT}) and group B (bilateral scapular muscle strengthening and conventional PT) - with 21 patients in each group. All the patients were assessed with Berg balance scale (BBS), voluntary control grading of upper limb (VCG), and bilateral scapular muscle recruitment by Electromyography (EMG). The treatment was given for 5 days a week for 4 weeks. After 4 weeks effect of interventions were assessed by BBS, VCG and EMG.

Conclusion: Bilateral scapular muscles strengthening combined with conventional PT showed improvement in dynamic balance and had an additional effect on muscle recruitment, control of upper limb and mobility in stroke patients.

Keywords: *Stroke, scapular muscles, berg balance scale, EMG, Dynamic balance.*

Introduction

The defination of stroke was issued by the WHO as: a rapidly developing clinical signs of focal or global disturbances of cerebral function, with symptoms lasting for more than 24 hours or leading to death, with no apparent cause other than of vascular origin. [1] It is the most common life threatening neurological disorder. [2]

Cerebrovascular stroke (CVS) is a neurologic event related to diseases of the cerebral circulation.[1] CVS has been shown to be a major cause of death and disability in all communities. According to the American Stroke Association, about 87% of strokes are ischemic, and the remaining 13% are hemorrhagic. Stroke is the fourth leading cause of death and long term disability in developed countries among adults. Each year approximately 7, 95,000 individuals experience stroke; approximately 6, 10,000 are the first attack and 1, 85,000 are recurrent strokes. Women have a lower age–adjusted stroke incidence then men, but this is reversed in older ages, women with 85 years and above have high rate of risk compared to men.[3]

After an immediate discharge from the hospital, stroke patients are at a high risk of fall (1.3–6.5 falls/person/year) while performing transfer activities on bed and out of bed. After an insult to the brain falls it can cause various problems in everyday life disturbing the daily activities. Stroke survivors' has more frequency of fall and injury compared to general older population.[9]

Approximately, one third of the stroke survivors will have residual disability on the affected side, with the severity of hemiparetic upper extremity, a significant determinant of post-stroke disability and quality of life of the patient. Therefore, impact of upper limb impairments on disability and health is very obvious.[5]

However, limited attention has been given to upper-extremity rehabilitation after stroke, and generally functional recovery of the upper limb and hand is limited compared with that of lower extremities. Upper limb hemiparesis leads to various impairments of daily living like eating, dressing, bathing, self care activities and writing, which result in reduced functions of daily living. Therefore, stroke individuals must participate into various rehabilitation programs to improve their activities of daily living.[5]

In stroke survivors', ability of controlling balance is reduced. Especially, the postural sway in static position is more than twice that of the healthy individual of the same age group, which consequences for safety.[10] Balance is described as the co-ordination in which all forces acting on body are balance such that the center of gravity (COG) is within stability limits, the boundaries of base of support (BOS).[11] Balance has been implicated in the poor recovery of activities of daily living (ADL) and mobility and increased risk of falls. Therefore, it is important to maintain balance in activities of daily living (ADL), posture control is essential, while motor, sensory and higher cognitive functions play an important role in postural control. There are various factors that influence selection of balance strategies and they are as follows 1) Speed and intensity of the displacing factors. 2) Characteristic of support surface 3) Magnitude of the displacement of the COM 4) Subject's awareness of the disturbance 5) Subjects posture at the time of perturbation 6) Subjects prior experiences.[22]

The scapula provides dynamic stability with controlled mobility at the glenohumeral and scapulo-thoracic joint. It plays a significant role in facilitating shoulder joint function, as anatomy and biomechanics of the scapula allow for controlled movement of shoulder joints. Scapular stabilization exercise may be effective in increasing muscle strength, balance and decreasing scapular dyskinesis.[13]

In stroke condition, it is observed that lattisimusdorsi, teres major and serratus anterior do not take part in any of the synergic patterns (flexion synergy and extension synergy).[3]

Muscles are providing stability. The serratus anterior and rhomboid muscles, attached to the scapula, have the crucial function of scapular stabilization. The serratus anterior is to stabilize the scapula during elevation and pulls the scapular forward. Weakness in the serratus anterior can impair scapular orientation and stability, thereby contributing to pathologic kinematics. Latissimusdorsi is a trunk muscle but it assists in scapular depression with various agonist muscles like serratus anterior, lower fibers of trapezius and pectoralis minor. Adducts, extends and internally rotates the arm at the shoulder.[14]

As per Brunstorm's recovery stage, stage 2 of Brunstorm is a stage where there is change in muscle tone i.e from flaccidity to spasticity emerges, which leads to impairment of upper limb, lower limb and trunk control. From these impairments one of the problems chosen is dynamic balance. There are various forms of exercise for stroke patients to improve balance in the individuals like manual perturbation, rhythmic rotation, rhythmic stabilization and many more. Therefore by using scapular muscles strengthening to improve dynamic balance is being introduced.

Stroke is a chronic condition and have to spend the more time of rehabilitation, and from the early stage that is inpatient in the acute care hospitals physiotherapy intervention are the primary mechanisms by which functional recovery, mobility and functional independence of patient are achieved in stroke.[9] There are various therapeutic interventions which can be given to improve balance by using electrotherapy, exercise therapy and many more.

This study examined the effect of scapular muscles strengthening on dynamic balance in post stroke individuals. We also investigated the balance of the patient using BBS, scapular muscles recruitment of the patient at its maximum effort by EMG, and pattern of movement by VCG to see the postural and trunk control during change in position. Therefore, to improve balance and postural control during the dynamic movement's bilateral scapular strengthening exercise has been given to the patients.

Method

Study Type: Experimental study

Study Design: Pre test or post test

Sample Size: 42 (21 + 21)

Place of Study: Krishna Hospital and Physiotherapy OPD, Karad

Criterion for Study:

Inclusion criteria:

- Stroke with MCA infarct
- Both males and females
- Age ≥ 30 years
- Brunstorm stage 2 and above
- Voluntary control grade ≥ 2
- Poor or fair balance in sitting and standing

Exclusion criteria:

- Patient not willing to give consent
- Sensory impairment
- Any associated orthopedic and cardio respiratory condition
- Patients with unilateral neglect
- Visual impairment

Procedure: By using random sampling method the participants had been divided into 2 groups by chit method; Group A, Group B. subjects with stroke with impaired balance and scapular muscle weakness had been assessed by BBS, EMG, VCG of upper limb.

The intervention had been given for 4 weeks and treatment will be given 5 times a week.

Intervention protocol for group A and group B

Group A (Control Group)	Group B (Experimental Group)
• Sustained stretching • Slow icing • Tapping • Slow brushing • Continuous joint compression • Trunk rotation in supine specific to shoulder joint • Passive movement • Active assisted exercise • Resisted exercise • Sit on a chair and place the pelvis and the spine in the neutral position • Put the less affected arm on a support table • Balance exercises • Manual pertubation • Electrical stimulation	• Conventional exercise and • Stabilization Exercises (Open chain, • Closed chain and Dynamic closed chain scapular stabilization exercise) • Dynamic strengthening exercises of scapula • Reaching out with the arm in different direction moving the scapula out as far as possible

Outcome Measure:

1. **BBS:** BBS is a 14 item rating 5 point ordinal scale, used to evaluate the balance in elderly population and other neurological conditions. It is easy to administer and doesn't require specialized training and takes 15-20 mins. It has moderate to excellent sensitivity while measuring balance in stroke patients, maximum scoring in BBS is 56.
2. **VCG of upper limb:** VCG has 7 components in it rating from 0- 6 point Ordinal Scale, which is used in various upper motor neuron (UMN) lesions. It is used to assess the control of the limbs in UMN lesions. It is an active movement performed by the patient and depending upon the quality of movement performed the grading is done.
3. **EMG:** It was done by a physiologist. The EMG machine was of the company "octopus clarity"

Results

Table No. 1: Comparison of post- post BBS between the group

	Conventional V/S experimental post - post
Conventional Post (mean± SD)	36.66± 6.981
Experimental Post (mean± SD)	50.09± 4.49
p value	<0.0001
t value	6.729
Df	20

Table No. 2: Mean Comparison of post- post VCG between the groups

	Right	Left
Conventional Post (mean± SD)	3.53± 0.51	3.375± 0.51
Experimental Post (mean± SD)	5.16± 0.57	4.55± 0.72
p value	<0.0001	0.0017
t value	7.472	3.811
Df	23	15

Table No. 3: Mean Comparison between conventional and experimental post right hemiplegic side

EMG	INFRASPINATUS		RHOMBOIDUS MAJOR		SERRATUS ANTERIOR		LATISSIMUS DORSI	
	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT
Conventional post (Mean ± SD)	49.56± 19.33	89.86± 31.21	53.55± 23.80	77.71± 22.14	63.73± 22.38	86.63± 18.68	57.06± 18.83	93.66± 23.04
Experimental POST (Mean ± SD)	96.35± 40.97	123.86± 30.63	82.36± 25.66	97.00± 11.64	90.23± 29.47	107.54 ± 30.78	89.02± 20.47	128.83 ± 32.89
p VALUE	0.0012	0.0116	0.0078	O.0130	0.0182	0.0498	0.0005	0.0049
t VALUE	3.699	2.744	2.913	2.692	2.544	2.072	4.065	3.116
Df	23	23	23	23	23	23	23	23

Table No. 4: Mean Comparison between conventional and experimental post left hemiplegic side

EMG	INFRASPINATUS		RHOMBOIDUS MAJOR		SERRATUS ANTERIOR		LATISSIMUS DORSI	
	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT
Conventional post (Mean ± SD)	62.87± 13.83	48.22± 18.33	74.85± 12.06	48.03± 24.91	68.92± 24.66	72.46± 23.74	61.08± 9.10	78.75± 19.74
Experimental POST (Mean ± SD)	148.58± 46.01	98.27± 48.09	96.24± 22.23	98.21± 27.72	110.32 ± 21.96	68.33± 10.60	129.28 ± 20.07	103.44 ± 22.97
p VALUE	0.0001	0.0145	0.0288	0.0014	0.0022	0.6431	<0.000 1	0.0322
t VALUE	5.053	2.762	2.418	3.904	3.684	0.4728	8.169	2.361
Df	15	15	15	15	15	15	15	15

Statistics: The outcomes were assessed at the 1st day prior to treatment and at the end of 4th week post treatment. Inter group analysis was done by paired t test and intra group analysis was done by using unpaired t test. The inter and intra group analysis was done by using Instat 3.

Discussion

Dynamic balance is a very complex process which requires interaction between various components like vestibular, visual, proprioceptive, musculoskeletal and cognitive systems. Dynamic control to stabilize the body when the support surface is moving or when the body is moving on a stable surface, such as sit to stand transfer or walking.[18]

One of the keystone structures of the body is scapula which plays an important role in postural control.

Muscle sling in the trunk are necessary for facilitating reciprocal gait pattern between upper and lower extremity as well as for rotational trunk stabilization. Muscle sling plays an important role in maintaining and providing dynamic movements of the body. As all the slings are inter-related to each other, if one part of the muscle sling is activated automatically other muscles involved in the sling are activated to provide the dynamic movement while performing any activity of daily living. There are three types of sling and they are anterior, posterior and spiral. Therefore, wrapping from the posterior to the anterior the muscles are rhomboids and serratus anterior.

In the present study, the participants were selected on the basis of inclusion and exclusion criteria. In the study there were 11 males and females in group A whereas, 16 males and 5 females in group B. in group A there were 13 right and 8 left hemiperatic side, in group B there were 12 right 9 left hemiperatic patients.

In this, the efficacy of the scapular stabilization and strengthening exercises in improving dynamic balance in post stroke individuals were investigated. They were investigated using BBS, VCG upper limb and bilateral scapular recruitment by EMG. The intervention was given for 5 days a week for 4 weeks. In group A the conventional PT was given whereas, in group B scapular strengthening (stabilization) exercise along with conventional PT was given. Scapular strengthening exercises were given in various positions like prone and sitting.

Post- intervention it was found that there was significant improvement in all the muscles strength when examined on EMG. But only Lt Serratus anterior muscle was found that there is no significant improvement may be because Lt Serratus anterior muscle works more at acromio- clavicular joint and is responsible for more work at shoulder complex and another reason may be because of dominance of hand as dominant side muscle are strong as compared to non- dominant side.

During the initial stages, patient had difficulty in moving trunk or in performing trunk activities due to which it happened that various upper limb and lower

limb activities of daily living. As the intervention was going on for the patient, they felt more free mobility and enhanced the activity of daily living. Some patient had impaired scapular position initially, as the scapular muscle got strengthen, it helped in correction and better mobility of the scapula and upper limb

Relatively, small changes in the scapular muscles affect the alignment and forces out the shoulder complex. Because scapula plays an important role in controlling shoulder joint position and joining it with the humeral head. [5]

Chiang-Song reported concluded that scapular stabilization exercise program did not have any improvement in berg balance and basic daily activities.[5]

Karatas M concluded that trunk muscle strength had a significant improvement in BBS and FIMS.[18]

Dae-Jung Yang concluded that scapular stabilization exercises are more effective then task oriented training in facilitating muscle activity and functional capacity of upper limb.[7]

After comparing with the previous study, scapular stabilization exercise is important for performing the mobility. One of the studies had no significant improvement in the balance due to limitation of the subjects and exercises given to the patients.

In the present study, after comparing the results with the previous study it suggests that to perform dynamic balance, scapular strengthening (stabilization) is important and also helps in maintaining postural stability.

Therefore, scapular stabilization and strengthening plays an important role in maintaining dynamicity of the body. There was an additional effect on scapular muscle strength an improvement in upper extremity control.

Conclusion

The present study provided the evidence to support that the bilateral scapular muscles strengthening along with conventional physiotherapy and conventional physiotherapy alone has shown improvement in balance, voluntary control and strength in stroke patients.

However, the subjects treated with bilateral scapular muscles strengthening along with conventional physiotherapy showed an additional benefit on Dynamic Balance and Mobility of the patients.

Conflict of Interest: It is difficult to get samples who are having Brunstorms recovery stage 2 and VCG at 2 simultaneously.

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Ethical Clearance: The study was approved by the institutional etjics committee of KIMSDU.

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In Vitro Antibacterial and Anticancer Study of Bioactive Compounds Isolated from Punica Grantum Peel

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Abstract

Plants have been used as natural medicines since the dawn of human kind. This research was focused on phytochemical analysis of Punica grantum peel extract consist of ethanol: chloroform (99:1) as solvent and its constituents were molecularly characterized by GCMS analysis and its ability as an antioxidant, anticancer against K562 cell and antibacterial against some food borne pathogens which comprises of 5 gram-positive and 3-gram-negative bacteria. The phytochemical analysis was performed biochemically and results reveals the presence of secondary metabolites such as Flavonoids, Alkaloids, Tannins, Saponins, etc. and absence of glycosides. The extract was tested against both gram-positive and gram-negative bacteria by agar well diffusion method and its results have shown that the streptococcus faecalis have shown highest susceptibility against the extract. Its antioxidant potential was quantitatively determined by DPPH assay and results showed high range of antioxidant present in the extract with IC50 as 504.9µg/ml. The cytotoxicity assay was performed with peel extract of different concentration against K562 cancer lines which is a myelogenous leukemia cell line. However, the cytotoxicity is less when compared with cell viability and its effects were mild against the cancer cells.

Keywords: *Punicagranatum, DPPH, GCMS, K562 cancer cells (myelogenous leukemia).*

Introduction

Punicagranatum, whose common names are pomegranate, grenade, granats and punica apple, belongs to the Punicaceae family which is a deciduous shrub that grows between 5 and 10m tall with multiple spiny branches and lives extremely long. The fruit is red purple in colour and it is cultivated in Mediterranean region since 3000 BC.[1,8] Some researchers studied the phytochemistry of P. granatum peels and found that the peel extract had abundant polyphenolic compounds mainly tannins and flavonoids, which are responsible for astringent and antioxidant properties.[13] The secondary metabolites of P. granatumpeel extract such as tannis, flavonoids, other polyphenols and some anthocyanins have various pharmacological activities like anticancer activity by flavonoids and antimicrobial activity by tannins and also some alkaloids are useful for treating HIV infection.[2,4]Agrobacterium tumefaciens, which is the causative agent of plant tumour was suppressed by the crude extract of P. granatum peels.[4] Various parts of P. granatum have been used in traditional medicine for treating many diseases like diarhoea, diabetes, ulcer and also digestive system disorders.[1,4] P.granatum also reported antivirus, antiproliferative, antimutagenic, antidiabetic, antidiarrheal, anti-obesity, antifungal properties and also photo-protection activity. [12,13] Antibacterial activity against different strains of bacteria like E. coli, L. monocytogenes, E. aerogenes,

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K. oxytoca, B. subtilis, S. agalactiae and S. aureus was shown by P. granatum peel extracts.[3] The components in P. granatum juice that inhibits the cancer cells was identified by scientist in December,2010.[6] The peel extract of P. granatum was tested on Human Chronic Myeloid Leukemia (CML) (K562) cell lines in order to test the anticancerous property.[5] The compounds present in P.granatum peel extracts like gallocate chins, delphinidin, cyaniding, gallic acid and ellagic acid, pelargonidin and sitosterol show therapeutic properties.[7] The infections present in sexual organs of humans and also infections like mastitis, acne, etc., were treated by the pericarp of P.granatum.[8] The antioxidants which are present in the fruits and vegetables such as ascorbic acid, flavonoids and tannins are used to play an vital role in the prevention of diseases. The biomolecules such as proteins, lipids, DNA, RNA are when reacted with the unstable Reactive Oxygen Species (ROS), it will react rapidly and destructively. Most microorganisms that colonize gingival margin or gingival sulcus are compatible with periodontal health.[9,10] The Phytoestrogenic compounds are present in the pomegranate seed oil and also the fruit has strong antioxidant activity which is because of the high levels of phenolic compounds. The pomegranate seed oil has an inhibitory activity on skin and breast cancers.[11] The incidence of collagen-induced arthritis was reduced due to the consumption of pomegranate extract.[12] The characterization of the phytochemical constituents present in P. granatum peel extract was done by GCMS analysis.[14]

Identification and Handling of Sample: Fruits were collected from local market in Sathyamangalam, which is situated in the southern part of India and brought to laboratory. The fruit was thoroughly cleaned with H_2O. The leathery peel was separated from edible portions by cutting it carefully. Later the peel was dried in a hot air oven at 45°C for 48 hours. Later the dried peels were pulverized into fine powder by using a blender and then it is stored in air tight compartment.

Extraction: The shattered peel powder of 10g was packed was packed within the filter paper. The Soxhlet's extraction method was carried out at 65°C for 6 cycles and the solvent was ethanol: chloroform (99:1) of 250ml. After extraction process the extract was concentrated to 25ml through steam distillationprocess.

Phytochemicalanalysis: Test for Tannins: The peel extract of 1ml and 5%ferric chloride were mixed together and the dark blue or green colour formation indicates the presence of tannins.[17]

Test for Saponins: The peel extract of 1ml was mixed with 1ml of distilled water and shook it vigorously. Formation of foam layer of about 1cm indicates the presence of saponins.[17]

Test for Quinones: 1ml of peel extract and 1ml of H_2SO_4 were mixed together and the red colour formation indicates the presence of quinones. [17]

Test for Flavonoids: 1 ml of peel extract was mixed with 1ml of 2N NaOH and the yellow colour formation indicates the presence of flavonoids. [17]

Test for Alkaloids: The peel extract of 1ml and 2ml of conc.HCl were mixed together and then few drops of Mayer's reagent was added. Presence of alkaloids was confirmed by formation of green or white colour precipitate. [17]

Test for Glycosides: One ml of the peel extract was added to 3 ml chloroform and 10% ammonium solution. Formation of pink col our indicates the presence of glycosides. [17]

Test for Cardiac Glycosides: 1ml of peel extract, 2ml of glacial acetic acid and few drops of 5% ferric chloride was mixed together. Then it was under layered with 1ml of conc. H_2SO_4. Presence of cardiac glycosides was confirmed by brown ring formation at the interface.[17]

Test for Terpenoids: 1ml of peel extract and 2ml of chloroform were mixed together and then few drops of conc. H_2SO_4 was added. The presence of terpenoids was confirmed by the formation of red brown col our at the interface.[17]

Test for Phenols: 1 ml of peel extract and 2ml of distilled water were mixed together and then few drops of 10% ferric chloride was added. The presence of phenols was confirmed by formation of blue or green colour.[17]

Test for Steroids: 1ml of the peel extract and 2ml of chloroform followed by 1ml of H_2SO_4 were added and the presence of steroids was confirmed by formation of reddish-brown ring at interface.[17]

GC-MS:

The sample was subjected to GC-MS analysis to

quantify the number of molecules and its structures. The analysis was carried out using GC–MS (Perkin Elmer model: Clarus 680) and also it is equipped with mass spectrometer (Clarus 600 (EI) analysed using (Turbo Massver 5.4.2) software. Fused silica which is packed with Elite-5MS. At a constant flow rate about 1ml/ min, carrier gas such as helium was used to separate the components. The temperature of the injector was adjusted to 260ºC while performing the experiment. The extract sample of 1µl was injected into the equipment the temperatures of the oven were 60ºC (2 mins); followed by 300ºC at the rate of 10ºC min^{-1}; and 300ºC for 6mins. The conditions of the mass detector were: the temperature of transfer line was 240ºC; and ionization mode electron impact at 70eV, the duration time of scan interval is 0.2sec and scan interval is 0.1sec. The fragments from 40 to 600Da. The spectrum of components was corresponding to the database of the spectrum of established components gathered in the GC-MS NIST library.

Antibacterialassay: The antibacterial assay was performed against 5-gram positive bacteria such as Listeria. monocytogenes, Bacillussubtilis, Streptococcus agalactiae, Staphylococcus aureus, Streptococcus faecalis and 3-gram negative bacteriasuch as Escherichia coli, Klebsiella oxytoca, Klebsiellaaerogenes by following Agar well diffusion method. The following bacteria were inoculated in the sterile nutrient plates individually in triplicates by swabbing technique. The wells in diameter of 3.5mm were made using the sterile agar well puncher. The peel extract sample was diluted at different concentration (20%, 40%, 60%, 80%, 100%) using distilled water.Then the agar plates were placed in an incubator at ±37ºC. After 24 hours of incubation, the zone of incubation was measured in mm.

Antioxidantactivity: The antioxidant activity oft he extract was determined by 2,2-Diphenyl-1-picrylhydrazyl (DPPH) assay. Both Samples and Standards (Ascorbic acid) were taken in different concentrations and the volume was adjusted to 100µl using methanol. The DPPH solution of 0.1mM was prepared by using methanol as solvent. About 3ml of 0.1mM DPPH solution was mixed with samples of different concentrations and the negative control was prepared by adding 100µl of methanol to the 3ml of DPPH solution. The tubes with mixtures were allowed to stand in dark at room temperature for 30mins. The color change from violet to yellow indicates the presence of antioxidants and the quantification was done by measuring its absorbance at 517nm against the blank. The IC50 value (inhibitory concentration) was calculated for both sample and standard. The percentage of inhibition was calculated using the following formula:

$$\% \text{ of inhibition} = [A_0\text{-}A_1/A_0] * 100$$

Where A_0 is absorbance of control (i.e. DPPH solution without sample) and $A_1$is absorbance of sample or standard (i.e. DPPH solution with sample/standard).

Cytotoxic assay (MTT method): The results of each test were reported as the growth percentage of treated cells compared to untreated control cells. A 0.1 mL aliquot of the cell suspension (5×10^6 cells/100µl) and 0.1 mL of the test solution (10-50µl) were added to the wells, with the plates kept in an incubator (5% CO_2) at 37 °C for 18 h. After 18 h, 1mg/ml of MTT was added, and the plates were kept in the CO_2 incubator for 4h, followed by the addition of propanol (100µl). The plates were covered with aluminum foil to protect them from light and subsequently agitated in a rotary shaker for 10–20 min, afterwards the well plates were processed on an ELISA reader to obtain absorption data at 517 nm.

Cytotoxicity = [(Control- Treated)/Control] * 100

Cell viability = (Treated/Control) * 100

Results and Discussion

The researchers are continuously exploiting the plant extracts to produce potential drugs with reduced toxicity and increased medicinal properties. The ethanol: chloroform extract of Punica granatum peel was subjected to different phytochemical tests such as secondary metabolites flavonoids, tannins, saponins, alkaloids, cardiac glycosides, glycosides, quinones, terpenoids, phenols and steroids were qualitatively analysed by biochemical method and the results reveals the absence of glycosides in the peel extract. In plants glycosides are the energy source in inactive form. However, another study report shows glycosides are present in sample contains acetone as solvent.[17]

The GCMS analysis revealed the compounds present in the extract in molecular level. The molecule 4-hexen-3-one, 4,5- dimethyl which is an oxygenated hydrocarbon showed highest peak followed by 4-ETHYL-2-hydroxycyclopent-2-en-1-one and 3-heptanol, 3, 6-dimethyl showed high peaks, Figure 1.

The antibacterial assay was performed using the peel extract against different bacterial strains such

as Bacillus subtilis, Escherichia coli, Streptococcus agalactiae, Staphylococcus aureus, Listeria monocytogenes, Enterobacter aerogenes, klebsiella oxytoca and streptococcus faecalis. The results indicate that streptococcus faecalis and Listeria monocytogenes have shown the highest susceptibility to the peel extract. Bacteria such as Streptococcus agalactiae, Staphylococcus aureus were less susceptibility to the peel extract. The gram-positive bacteria have exhibited both high sensitivity and resistivity. The gram-negative bacteria such as Escherichia coli, Klebsiella oxytoca, Klebsiellaaerogenes has exhibited moderate sensitivity. The zone of inhibitions is represented in the Figure 2.

The DPPH results indicate the high number of antioxidants were present in the sample. The IC50 value for both standard (Ascorbic acid) and sample (peel extract) were measured from the graph reveals that standard has 482.5µg/mland the sample have 504.9µg/ml. The obtained values are represented in Figure 3.

The MTT results reveals the peel extract have shown mild effects over the K562 cancer cells. The cell death was increased with increase in concentration on the sample. Another experimental result tested against the Hepato-cellular carcinoma and Colon cancer cell lines have shown a severe effect where they tested with Punica granatum seeds and husks.[15] Another experimental study tested using polysaccharide (PSP001) separated from P.granatum fruits against the K562, MCF-7, KB cancer cell lines have proved its potential ability as an antitumor agent.[16] The activity of sample at different concentrations against the cells are displayed in Figure 4 and the cytotoxicity is represented in Figure 5.

Table 1: The phytochemical constituents of Punica grantum peel extract

Phytochemicalconstituents	Presence
Tannins	+
Saponins	+
Quinones	+
Flavonoids	+
Alkaloids	+
Glycosides	-
Cardiac Glycosides	+
Terpenoids	+
Phenols	+
Steroids	+

(+ present, - absent)

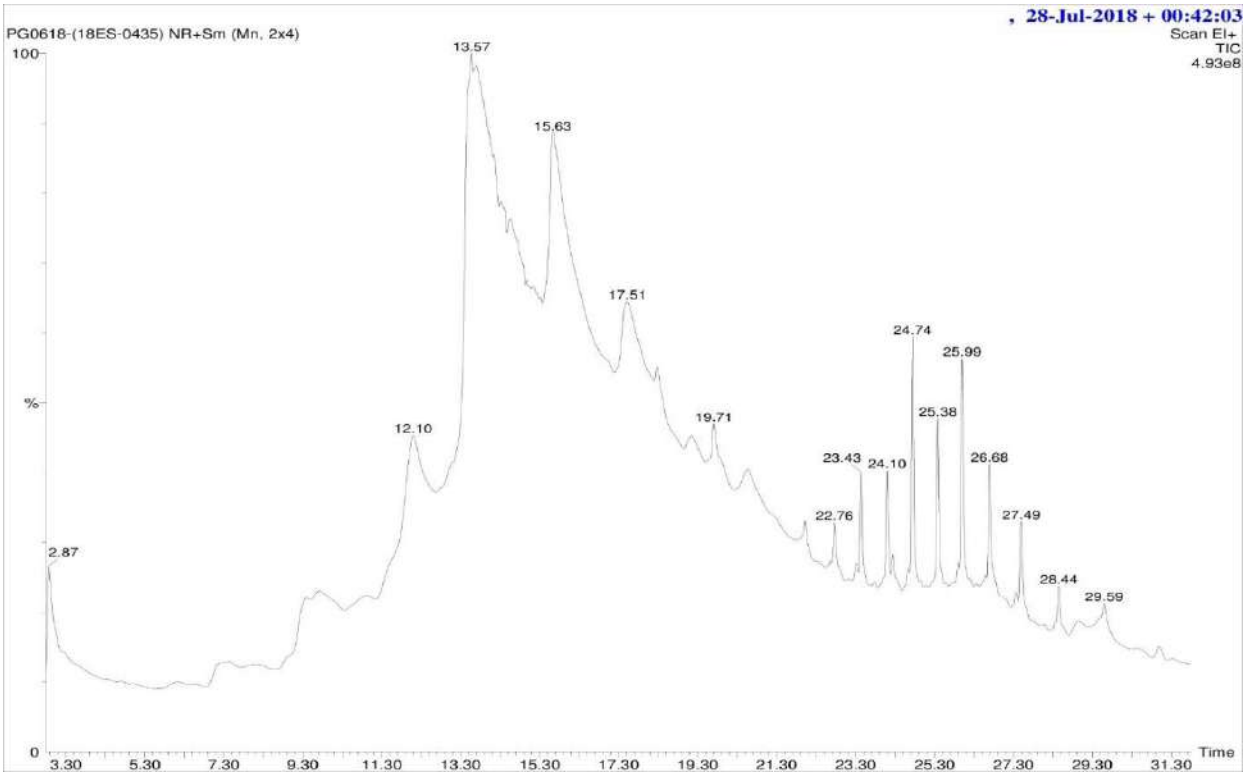
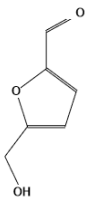
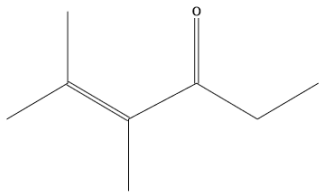
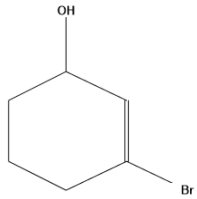
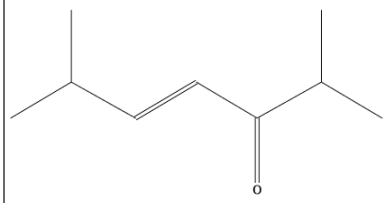
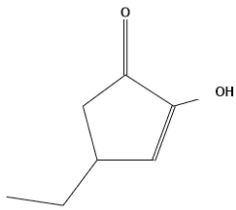
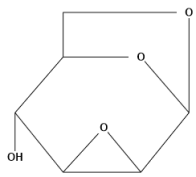
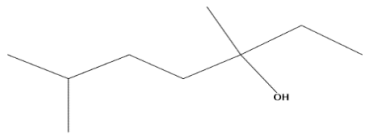
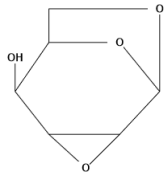
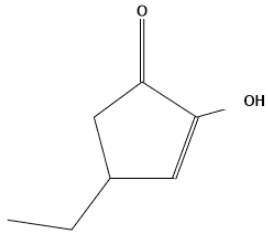
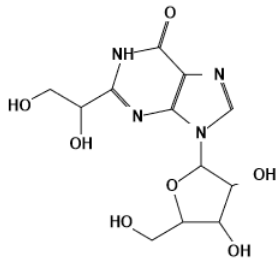
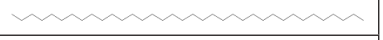
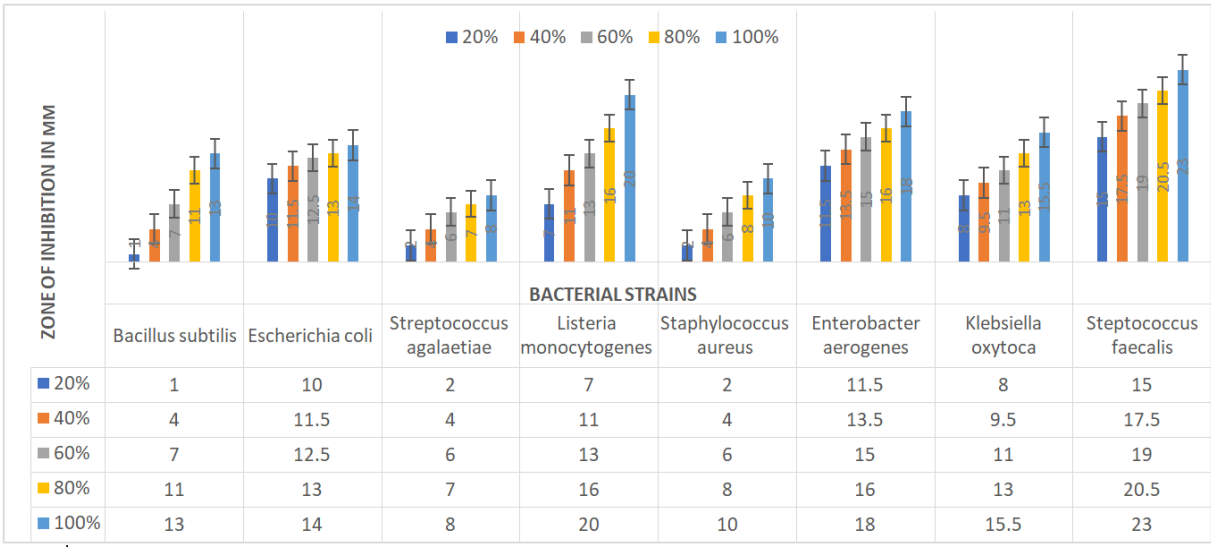


Figure 1: Chromatogram of compounds present in Punica granatum

Table 2: GCMS analysis result for major phytocomponents in Punica grantum peel

RT	Name of compound	Molecular formula	Molecular weight	Peak area	Structure
13.488	2-FURANCARBOXALDEHYDE, 5-(HYDROXYMETHYL)-	$C_6H_6O_3$	126	6.965	
13.578	4-HEXEN-3-ONE, 4,5-DIMETHYL-	$C_8H_{14}O$	126	3.082	
13.708	2-CYCLOHEXEN-1-OL, 3-BROMO-	C_6H_9OBr	176	5.132	
14.143	4-HEPTEN-3-ONE, 2,6-DIMETHYL-	$C_9H_{16}O$	140	3.374	
15.654	4-ETHYL-2-HYDROXYCYCLOPENT-2-EN-1-ONE	$C_6H_{10}O_6$	126	41.158	
16.284	2,3-ANHYDRO-D-MANNOSAN	$C_6H_8O_4$	144	7.881	
17.479	3-HEPTANOL, 3,6-DIMETHYL-	$C_9H_{20}O$	144	9.510	
19.160	2,3-ANHYDRO-D-GALACTOSAN	$C_6H_8O_4$	144	4.156	

RT	Name of compound	Molecular formula	Molecular weight	Peak area	Structure
19.700	4-ETHYL-2-HYDROXYCYCLOPENT-2-EN-1-ONE	$C_7H_{10}O_2$	126	2.911	
20.486	2-[1,2-DIHYDROXYETHYL]-9-[. BETA.-D-RIBOFURANOSYL] HYPOXANTHINE	$C_{12}H_{16}O_7N_4$	328	3.222	
24.732	HEXATRIACONTANE	$C_{36}H_{74}$	506	6.674	
25.988	HEPTACOSANE, 1-CHLORO-	$C_{27}H_{55}Cl$	414	5.934	



	Bacillus subtilis	Escherichia coli	Streptococcus agalaetiae	Listeria monocytogenes	Staphylococcus aureus	Enterobacter aerogenes	Klebsiella oxytoca	Steptococcus faecalis
20%	1	10	2	7	2	11.5	8	15
40%	4	11.5	4	11	4	13.5	9.5	17.5
60%	7	12.5	6	13	6	15	11	19
80%	11	13	7	16	8	16	13	20.5
100%	13	14	8	20	10	18	15.5	23

Figure 2: Different Bacteria and its zone of inhibition

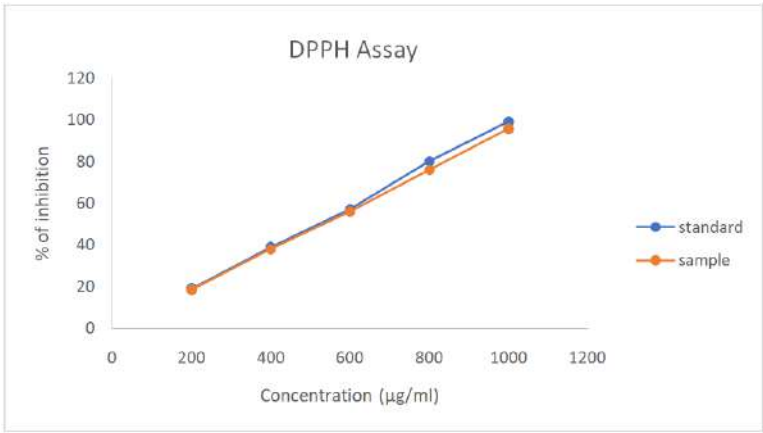


Figure 3: DPPH scavenging activity.

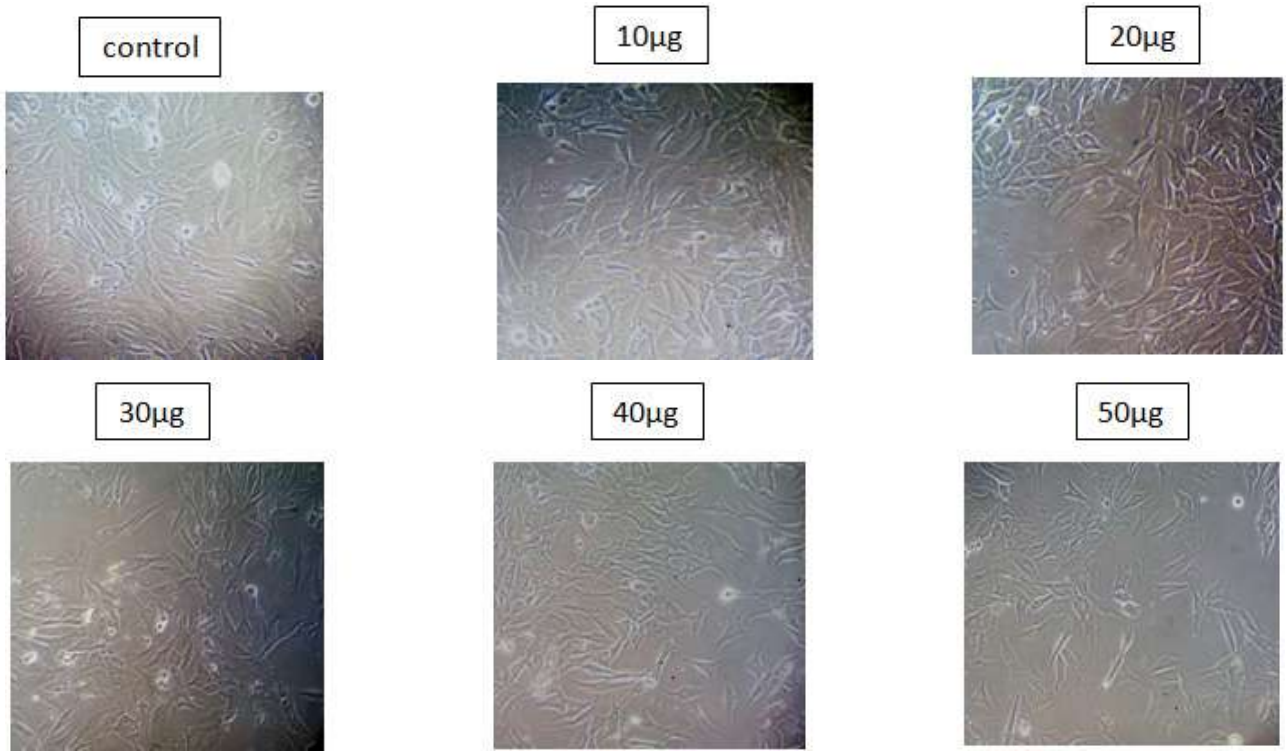


Figure 4: K562 cells reactions at different sample concentrations.

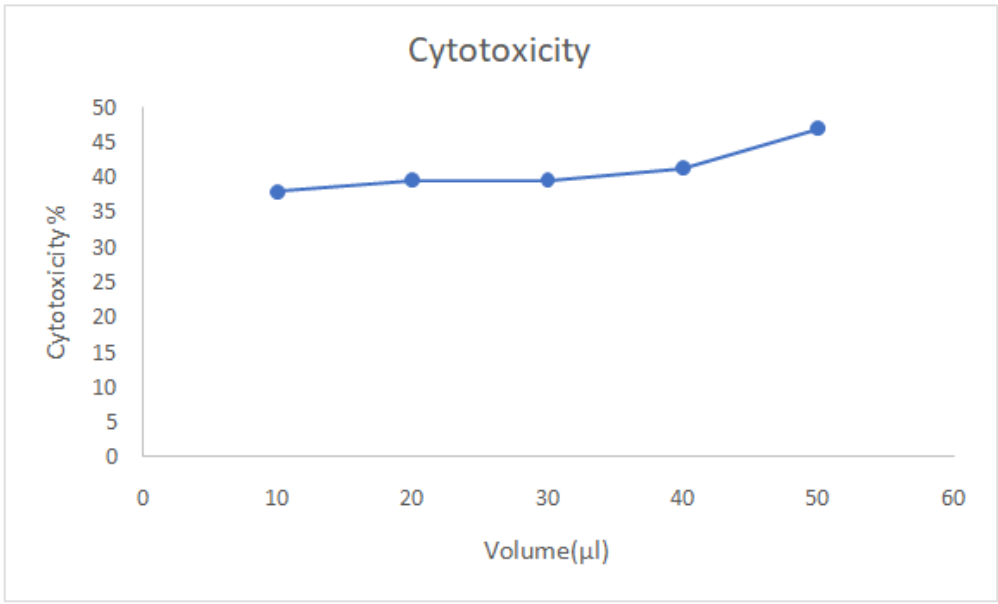


Figure 5: Cell death percentage of K562 cells against Punica grantum.

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A Study on Utilization of Primary Health Care Services among the People Residing in a Semi-Urban Area

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Abstract

Background: Primary healthcare is a vital strategy which remains the backbone of health service delivery. As on March 31st 2017, there were a total of 25, 650 primary health centres(PHC) functioning in the country. Though the number of PHC's had increased, the utilization is declining over the years as people seek private health sectors due to various reasons. Objective: To assess the awareness and utilization of primary health care services provided by Thirumazhisai PHC. Methodology: A Community based cross-sectional study was conducted among people residing in Thirumazhisai. The Sample size of 233 was calculated. The study population was selected by simple random sampling technique. A pre-designed, pre-tested semi- structured questionnaire was used to collect data. Data entered in MS excel and analyzed using proportion. Results: Among 233 people, 183 (78.8%) people knew about PHC services. Regarding utilization of services, 165(70.8%) were availing services provided by PHC. The reasons given for non utilization of services were long waiting time (51.4%), dissatisfaction of Doctor-Patient relationship(17.7%), non-availability of essential medicines (14.7%), PHC not clean (8.8%), and PHC does not have all required services (7.4%). Conclusion: In resource-constrained developing countries like India, all efforts should be undertaken to bring about the maximum efficiency of health care delivery. Role of primary healthcare is essential in the progress towards achieving universal health coverage (UHC).

Keywords: *Primary health care, primary health centres, awareness, utilization.*

Introduction

The Alma-Ata Conference held in 1978 set the goal of attaining the 'Health for all' by 2000 through primary health care approach.[1] Primary health care is defined as "Essential health care made universally accessible to individuals and acceptable to them, through their full participation and at a cost the community and country can afford". In India Primary health care is delivered through a network of Primary Health Centers (PHC).[1]

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PHC is the first level of contact and also direct link between the health care provider and the community. According to the National Health Plan 1983, the primary health centers were reorganized on the basis of one PHC for every 30,000 rural populations in the plains, and one PHC for every 20,000 population in hilly, tribal and backward areas for more effective coverage.[1]

PHC provides OPD services, free medicines, health education, antenatal services, immunization, family welfare services and information on basic sanitation.[2] As on March 31st 2017, there were a total of 25, 650 PHCs functioning in the country. Percentage of PHCs functioning in government buildings has increased significantly from 78% in 2005 to 90.9% in 2017. In Tamilnadu, out of total 1835 PHCs, 473 PHCs are in urban areas.[3]

Though the number of primary health centres had increased, the utilization is declining over the years as

people seek private health sectors due to various reasons.[4] In 2015, an estimated 8% of the Indian population had been pushed below the poverty line by high out-of-pocket expenditure for health care.[5]

This study is conducted to assess the awareness and utilization of primary health care services provided by a Government PHC in urban field practice area of a Private Medical College near Chennai.

Methodology

A community based cross sectional study was conducted in Thirumazhisai, a semi–urban area located near Chennai. The study was conducted between May 2017- July 2017. Households in Thirumazhisai were selected by Simple Random Sampling. One person from each household was selected. The sample size of 233 was calculated by using prevalence of 62% utilization of PHC services.[6] A pre-designed, pre-tested semi-structured questionnaire was used to collect data. Data on socio-demographic details, awareness and utilization of PHC services and reasons for non utilization was collected. People who were willing to participate in the study were included and those who were not available in households were excluded. Data was entered in MS excel and analysed using proportions.

Results

Details regarding demography of study population: In the present study, majority of participants belong to the age group 25-34 years (36.5%). Male population was 128 (55%) and female population was 105 (45%).Modified Kuppuswamy scale was used to assess the socio economic status of study population. Majority of the population belonged to upper middle class (40.8%). (Table 1)

Table No. 1: Demographic details of study population

Demographic Details	Number (n = 233)	Percentage
Age		
15-24	9	3.8%
25-34	85	36.5%
35-44	60	25.7%
45-54	79	34%
Sex		
Male	128	55%
Female	105	45%
Socio Economic Status		
Upper Class	10	4.3%
Upper-Middle Class	95	40.8%
Lower-Middle Class	60	25.8%
Upper-Lower Class	50	21.4%
Lower Class	18	7.7%

Details regarding awareness of PHC services in study population: Among the 233 people,183 (78.5%) people were aware of PHC services and among all services the awareness for OPD services was high (28.9%). (Table 2).

Table No 2: Awareness of PHC services in study population:

PHC Services	Number of People Aware (n = 183)	Percentage
Immunization services	15	8.2%
Family welfare services	42	23%
Lab facilities	23	12.5%
Antenatal services	20	11%
Essential medicines	30	16.4%
OPD services	53	28.9%

Details regarding utilization of PHC services in study population: Among 233 people, 165(70.8%) were availing services provided by PHC. Majority of the population utilized OPD services (29%) followed by family welfare services (23.6%).

Table No 3: Utilization of PHC services in study population:

PHC Services	Number of People Utilize (n = 165)	Percentage
Immunization services	13	7.9%
Family welfare services	39	23.6%
Lab facilities	20	12.2%
Antenatal services	19	11.5%
Essential medicines	26	15.8%
OPD services	48	29%

Details regarding non utilization of PHC services in study population: In the present study one third (29.1%) of the participants were not availing PHC services. The major reason for non utilization of services was the long waiting time (51.4%). (Table 3)

Table No 4: Reasons for non utilization of services in study population

Reasons for non utilization	Number of People (n = 68)	Percentage
Long waiting time	35	51.4%
PHC not clean	6	8.8%
PHC does not have all required services	5	7.4%
Dissatisfaction of Doctor-Patient relationship	12	17.7%
Non-availability of essential medicines	10	14.7%

Discussion

The present study was focused on the awareness and utilization of PHC services. In the present study, 78.5% people were aware of PHC services in their area and this was found to be similar (76.2%) as reported by Rajpurohit et al in Barabanki, a rural area of Northern India.[7]

Majority of people in the present study were aware of OPD services followed by family welfare services. In the present study, 70.8% study population reported that they utilize PHC services. This was found much greater than the study in Barabanki, Northern India[7] and Nepal[8] which reported only 36.3% and 48% utilization respectively. Majority people in the present study utilized PHC for OPD services, family welfare and free drug services.

In the present study the major reason given by people who were not utilizing PHC services was long waiting time(51.4%) followed by dissatisfaction in doctor patient relationship (17.7%), non-availability of essential medicine (14.7%), cleanliness issues (8.8%) and not all required services available in PHC (7.4%). Rajpurohit et al [7]and Kumari R[9]also reported long waiting time 43.9% and 62.5% respectively as the main reason for non- utilization of PHC services in Barabanki and Lucknow.

In present study, low utilization of health care services was reported in spite of good accessibility to the PHC. Though, the facilities were existing, poor quality care and lack of drugs resulted in the non utilization of PHC services. Similar findings were also reported by YadavD K in rural Nepal.[8]

Recently Quality of Care has emerged as a crucial area for both Policy Makers and Public Health Practitioners. It is a key tool for optimal utilization of resources and improving health outcomes and client satisfaction.[10] Improving the quality of health care is also essential to meet the health related targets of the Sustainable Development Goals (SDGs). [11]

As a major initiative of Ministry of health and family welfare (MoHFW) under National Health Mission, Kayakalp initiative was launched in 2015 to promote cleanliness, hygiene and infection control practices in public health facilities. Under this initiative, public health care facilities are appraised and those facilities that meet the standard protocol receive awards and commendations. National Quality Assurance framework was rolled out in November 2014 to improve the quality of health care in over 31000 public facilities including PHCs.[12]

More qualitative research had to be carried out to determine the factors influencing utilization of services; this will lead us to develop a public health marketing strategy for care access.

For last two years (2018 & 2019) World Health Days Day theme is “Universal Health Coverage: Everyone, Everywhere.” Universal health coverage (UHC) means that all people and communities can use the promotive, preventive, curative, rehabilitative and palliative health services they need, of sufficient quality to be effective, while also ensuring that the use of these services does not expose the user to financial hardship. UHC can only be achieved by proper delivery and utilization of Primary health care services through PHCs.[13]

Conclusion

Only two third of the study population was found to be aware and were utilizing PHC services. In resource-constrained developing countries like India, all efforts should be undertaken to bring about the maximum efficiency of health care delivery. Role of primary healthcare is essential in the progress towards achieving Universal health coverage.

Limitations of the study: This study was conducted in our field practice area covered by one Urban PHC, therefore the findings cannot be generalised to all PHCs.

Conflict of Interest: Nil

Source of Funding: Nil

Ethical Clearance: Ethical approval was obtained

from the Institutional Review Board (IRB) and Institutional Ethics committee informed consent was obtained from study participants and information sheet regarding the study was given to all participants.

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An Empirical Relationship between Stress and Job Performance: A Study with Private School Teachers

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Abstract

Stress reacts in the human body with physical, mental and emotional responses. It may be positive or negative. Negative stress affects the concern person and the environment also. It is part of our body. Stress can experience stress from our environment, body, and thoughts. The main purpose of this study is to find the factors causing stress among the teachers working in private schools. The researcher used linear regression analysis to find the result. The results show that the main factor causing stress are role conflicts and Pay. The stress and job performance are negatively correlated. Stressful teachers not performed well compared with other teachers.

Keywords: *Stress, Job Performance, Role conflicts.*

Introduction

Stress is the important factor that affect employee's mood, health, behaviour and relationship with other employees. Some Individuals suffered with their young age and they are very healthy also. This is called acute stress. Nowadays, stress mostly affected on employees with high job pressure. There is a limit of stress i.e. it cross more than this limit it given negative, impact on their job otherwise the impact is positive.

The stress is affected not only because of job sometimes unhealthy behaviour causes stress. The main thing is to the person should know how to handle the stress without affecting their health and society. There is lot of awareness programs are conducting in the organisation to get rid from stress.

Stress is affected to the teachers those who are working in private schools. There are lot of reasons for causing the same such as pay, work load, long working hours, culture, task etc., To overcome the stress to the teachers management has to arrange some remedial classes like yoga, Meditation etc.

Stress Meaning: Stress is a feeling of people when the expectation is not fulfilled or demand is not satisfied it affects the concern person. The expectation or demands are related to work, promotions, finance, maintaining the relationship with other people. If this is failed stress can cause. It affects the people physically and mentally.

Some people feel the stress as a motivator. This is essential to survive and to fight with the problems day to day faced by the people. It teaches people how to respond in a risky situation.

Impact of Stress:

- Blood Pressure
- Breathing problems
- Digestive problems
- Reduce Immunity power
- Mental problems
- Affects Job
- Affects Family

Factors Causing Stress of Employees:

- Promotion
- Status of the Job
- Discrepancies in the pay
- Conflicts between the employees
- Target

- Competition
- Management problems
- Cultural differences
- No cooperation
- Work load
- Environment of the work place
- Job insecurity

The main factor of causing stress is the work place of the person. The demand and pressures of the Management causing stress to the employees. Conflicting role in the work place also affects employees to cause stress. The management has to arrange or follow the cope up strategies of stress to reduce and recover from the same.

In this research the researcher finds the factors causing stress to the private school teachers and impact on stress on their performance.

Review of Literature: Ahmad Usman et al (2011). Work Stress Experienced by the Teaching Staff of University of the Punjab, Pakistan: Antecedents and Consequences. This study tends to examine the relationship between role conflict, role ambiguity and attitudinal outcomes of the job i.e. job satisfaction and organizational commitment of teaching staff in the largest and most populated university of Pakistan i.e. University of the Punjab. The findings of the study suggests that there is a positive and significant relationship between role stress i.e. role conflict and role ambiguity and work stress however work stress is negatively and significantly associated with job satisfaction and organizational commitment of the teaching staff of the university under examination[1].

Sai Mei Ling and Muhammad Awais Bhatti (2014). Work Stress and Job Performance in Malaysia Academic Sector: Role of Social Support as Moderator. The present study aims to investigate the relationship role conflict, job control, social support and job performance among administration staff in University Utara Malaysia (UUM), Kedah. Results indicate that a positive and significant relationship found between job control, social support and job performance. Besides, results indicated social support moderate between role conflict and job performance showed significant relationship[6].

Janine, Oosthuizen et al (2013) Coping with stress in the workplace. The researchers investigated a simplified process model, a so-called salutogenic approach, of coping with stress in the workplace. As expected, individuals with a stronger sense of coherence and a stronger internal locus of control experienced lower levels of stress and vice versa. Nevertheless, in a regression analysis only the sense of coherence and external locus of control variables contributed significantly to variance in the criterion variable stress[3].

Moaz Garib et al(2016) The impact of job stress on job performance: A case study on academic staff at dhofar university. The purpose of this study is to determine the levels of job stress among the academic staff at Dhofar University, to measure the job performance level, and determine the impact of the job stress factors (workload, role conflict and role ambiguity) on job performance. Results show that the level of academic staff of job stress was medium and sometimes low. In addition, the level of Job performance was somewhat high. Moreover, it was found that workload has a positive statistical effect on job performance[5].

Ashfaq Ahmed, Dr. Muhammad Ramzan (2013). Effects of Job Stress on Employees Job Performance A Study on Banking Sector of Pakistan. This study examines the relationship between job stress and job performance on bank employees of banking sector in Pakistan. The results are significant with negative correlation between job stress and job performances and shows that job stress significantly reduces the performance of an individual. The results suggest to the organization that they have sustained a very health, cooperative and friendly environment within the team for better performance[2].

Mai Ngoc Khuong and Vu Hai Yen(2016). Investigate the Effects of Job Stress on Employee Job Performance—A Case Study at Dong Xuyen Industrial Zone, Vietnam. The purpose of this research was to analyse the effects of five working factors including work overload, role ambiguity & role conflict, working relationship, career development, and working environment on job stress and employee job performance in six different industries at Dong Xuyen Industrial Zone, Ba Ria–Vung Tau province, Vietnam. As a result, these working factors had significant and positive influence on job stress and in contrast, job stress had negative influence on employee job performance. In addition, this research also found that career development did not directly affect employee job performance, but indirectly through job stress. It is recommended that organizations

at Dong Xuyen Industrial Zone should reduce job stress by reducing conflicts in working relationship, career development, and working environment in order to improve employee job performance[4].

Sharmilee Bala Murali (2017) Impact of Job Stress on Employee Performance. The main Purpose of this study is to analyses the impact of job stress on employee performance. It found that time pressure and role ambiguity have significant and negative influence on employee performance. The other two factors of workload and lack of motivation do not have any significant influence on employee performance. Therefore we concluded that increasing time pressure and role ambiguity would reduce employee performance in all aspects[7].

Objectives of the Study:

1. To find the factors causing stress among the employees working in Private schools.
2. To know the impact of stress on Job Performance

Hypotheses of the Study

1. There is no significant difference among the factors causing stress among the employees working in Private schools.
2. There is no significant impact of stress on Job Performance

Result and Discussion

Influence on Stress on Job Performance: The stress consist of eight variables and it subsequent influence over Job performance is measured through linear multiple regression analysis. The variables are Role conflicts, Culture variance, Competition, Completion of target, Work load and Pay. The influence of these variables on Job performance are presented in the following regression analysis.

Table 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.950[a]	.902	.901	.435
a. Predictors: (Constant), S5, S1, S5, S3, S4, S2				

Source: Computed data

From the above table it is found that R=.950 R square = .902 and adjusted R square .901. This implies the stress causes 90% variance over the Job performance. The cumulative influence of six variables of stress over Job performance is ascertained through the following one way analysis of variance.

Table 2: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	860.347	6	143.391	757.758	.000[b]
	Residual	93.291	493	.189		
	Total	953.638	499			
a. Dependent Variable: Job Performance, b. Predictors: (Constant), S5, S1, S5, S3, S4, S2						

Source: Computed data

Table 2 presents that F = 757.758 p=.000 are statistically significant at 5% level. This indicates all the six variables cumulatively responsible for Job performance. The individual influence of all this six variables is clearly presented in the following co-efficient table.

Table 3: Coefficients[a]

Model B		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		Std. Error	Beta			
1	(Constant)	.257	.073		3.506	.000
	Role conflict	.681	.059	.626	11.617	.000
	Culture variance	.282	.086	.244	3.291	.001
	Competition	.217	.082	.198	2.651	.008
	Completion of Target	.101	.070	.082	1.432	.153
	Work load	.434	.075	.385	5.797	.000
	Pay	.356	.059	.356	6.078	.000
a. Dependent Variable: Job Performance						

Source: Computed data

From the above table it shows that Role conflict (Beta=.626, t=11.617, p=.000), Culture variance (Beta=.244, t=3.291, p=.001), Competition (Beta=.198, t=2.651, p=.008), Work load (Beta=.385, t=5.797, p=.000) and Pay(Beta=.356, t=6.078, p=.000) are statistically significant at 5% level. Completion of Target (Beta=.082, t=1.432, p=.153) are not statistically significant at 5% level.This indicates that role conflict among the teachers working in private schools causes more stress followed by pay given by the management. It reflects in their job performance as low performance level compared with other teachers.

Findings and Conclusions

1. There are many factors causing stress among the employees working in private schools.
2. The factors are role conflicts, culture variance, Competition, completion of target, work load and Pay.
3. The most important factor causing stress are role conflicts among the teachers followed by Pay and the least factors are completion of target and competition.
4. The impact of stress reflected in the Job performance of teachers working in Private schools.
5. They perform very low and they could not complete their target with in that period.
6. Finally, it concludes that the management should takes steps to reduce stress by the way of arranging motivational programs, given the pay based on their performance.

Testing of Hypotheses:

1. There is no significant difference among the factors causing stress among the employees working in Private schools - Rejected
2. There is no significant impact of stress on Job Performance - Rejected

Conflict of Interest: Nil

Ethical Clearance: Taken from UGC Committee

Source of Funding: Self

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Discovery of Hidden Pattern in Thyroid Disease by Machine Learning Algorithms

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Abstract

Background: Decision tree provides help in making decision for very complex and large dataset. Decision tree techniques are used for gathering knowledge. Classification tree algorithms predict the experimental values of women thyroid dataset. The objective of this research paper observation is to determine hyperthyroidism, hypothyroidism and euthyroidism participation in hormones can be good predictor of the final result of laboratories and to examination whether the propose ensemble approach can be similar accuracy to other single classification algorithm.

Results: In the proposed experiment real data from 499 thyroid patients were used classifications algorithms in predicting whether thyroid detected or not detected on the basis of T3, T4 and TSH experimental values. The results show that the expectation of maximization classification tree algorithms in those of the best classification algorithm especially when using only a group of selected attributes. Finally we predict batch size, tree confidential factor, min number of observation, num folds, seed, accuracy and time build model with different classes of thyroid sickness.

Conclusion: Different classification algorithms are analyzed using thyroid dataset. The results obtained by individual classification algorithms like J48, Random Tree and Hoeffding gives accuracy 99.12%, 97.59% and 92.37 respectively. Then we developed a new ensemble method and apply again on the same dataset, which gives a better accuracy of 99.2% and sensitivity of 99.36%. This new proposed ensemble method can be used for better classification of thyroid patients.

Keywords: *J48, Random Tree, Hoeffding, Prediction, T3, T4, TSH, hypothyroidism, hyperthyroidism, euthyroidism and ensemble model.*

Introduction

Hormones play major role in blood stream to maintain metabolism in human. The production of high hormones and low hormones both are dangerous. The general objective of thyroid gland is to produce thyroid hormones. The main objective of thyroid gland is to maintain bloodstream through the regulation of metabolism. If thyroid gland produces more hormones then it will be hyperthyroidism and if thyroid gland produces less hormones then it will be hypothyroidism[1].

The three hormones tri-iodothyronine (T3), L-thyroxin and TSH regulate the metabolic functions of human body. These hormones utilize proteins and manage fats in human body. In pituitary gland thyrotrophic stimulating is released if require more hormones. The pituitary gland control and manage production of hormones in the blood stream [2].

Thyroid disease is a different thing about all other diagnosis system. It's visibility and treatments are different. Thyroid hormone has many symptoms in initial to final stage. It is generally arises from disorder life style and foods after it increasing and decreasing hormones production finally make health system [3].

The paper analysis is organized on batch size, confidential factor, num decimal places, num folds, seed and accuracy of a model in decision making through J48, Hoeffding and Random Tree. The discuss about all dataset of thyroid in multiple way of classification tree algorithm and finally measure the evaluation accuracy increases with time built model training set.

Classification decision tree provide many types help in identification of thyroid disease. It provides better help in dataset classification as a tree model in which attributes represents root, nodes and leaf nodes. Analyst easily analysis all the functions of related dataset [4].

By the help of proposed three algorithms easily classify hyperthyroidism, hypothyroidism and euthyroidism. We easily indentify as a tree path and finally reach on decision node to leaf nodes. collect Present paper discuss to all the symptoms of thyroid patients and declare types of problem. It is very difficult to identify hyperthyroidism and hypothyroidism problems in another way [5].

Related Work: Ahmad et.al discussed about thyroid endocrine gland in blood issue and function of the body. They discussed by feature selection, Fuzzy rule, maximal absolute difference Linguistic Hedge and total serum thyroxin. They provided classification accuracy 98.604% and achieved different testing phase of clustering one, two, three and four clusters for each class and 12 fuzzy rules. The generated 88.372%, 90.6977%, 91.6744%, and 97.6744% cluster size during training phase [6].

Tahaniet.al discussed about clustering ensemble model and how combines multiple clustering models. They analyzed adaptive clustering ensemble model. Adaptive algorithm measured and transformed initial clusters into binary representation aggregation to produce final clusters. They used co- association, k-means, similarity measurement, machine learning and data mining[7].

Xiyu et.al discussed about new class of tissue system. They analyzed traditional tissue P systems to new class of tissue system. They used thyroid disease analysis, tissue P system,membranes structure and clustering algorithm. They analyzed thyroid disease for classification [8].

Amrollahiet.al discussed about effect on thyroid gland of human bodies. They analyzed how thyroid function managed and balanced the metabolism. They used expert systems Bio-chemistry. They used fuzzy rules to system provided help in non expert who are suspicions of their thyroid function and provided help in expert for their diagnosis [9].

Ahmad et.al discussed about thyroid hormones production from thyroid gland. They analyzed compression hard and fuzzy clustering for thyroid disease and find optimal number of clusters. They used thyroid disease K-means, K-model clustering fuzzy C-means. They improved actual number of clusters present in thyroid data set and find clustering performance is much better to compare to other[10].

Saiti et.al discussed about thyroid cancer by different classifier algorithms. They increase accuracy of thyroid cancer dataset. They generated an ensemble model to predict thyroid cancer and provided much accuracy compare to other previous prediction [11].

Vikas et.al discussed about medical dataset by different machine learning algorithms. They used data mining different algorithms for taking decision as a decision tree and regression tree. After all the prediction find 93% classification accuracy. They suggested to boost algorithm for prediction [12].

Vikas et.al discussed about breast cancer in women by some different machine learning algorithms. They used supporting key as like: Breast, Data Mining, Naïve Bayes and RBF Network. After all the prediction they find Naïve Bayes give the highest accuracy 97.36% [13].

Bridget et al. discussed about circulation serum FT4 level in pregnant women. In circulation FT4 perchlorate exposure is negatively associated with circulating levels in third trimester pregnant women. They used Perchlorate, Iodine, Pregnancy, birth and Weight[14].

Awasthiand Anil Antony discussed about classification and diagnosis of thyroid disease. They used KNN, Support Vector Machine, T3, T4 and TSH for diagnosis. They find some values missing while the user entering the values. They used K-Nearest Neighbor algorithm in thyroid diagnosis for approximating the missing values in the user input[15].

This analysis paper analyze classification tree algorithms: J48, Random tree and Hoeffding for predicting where thyroid hormones as like T3, T4 and TSH experimental values. The results show that the expectation maximization classification tree algorithmsin those of the best classification algorithm especially when using only a group of selected attributes. Summaries all the analysis paper predict batch size, tree confidential factor, min number of observation, num folds, seed, accuracy and time build model withdifferent classes of thyroid sickness.

Methodology

Collected thyroid dataset is from githubuci and pathology. The use of these data sets for only experimental purposes. We have used all methodology are used in four stages:

- Data Description
- Algorithm description
- Result and discussion
- Conclusion

Data Description:

Table 1: Thyroid Dataset variables representation

Source	**Rahul thyroid diagnosis center, https://github.com/mikeizbicki/datasets/blob/master/csv/uci/new-thyroid.names**		**References**
Sample Size	499= Total: 228 =Hyperthyroidism, 237= Euthyroid State and 34= Hypothyroidism		
Dependent Variables			
Hyperthyroidism	Too much hormone production		[3],[16]
Hypothyroidism	To little hormone production		
Euthyroidism	The state of normal thyroid function		
Independent Variables			
T3	(60-200)ng/dl	Triiodothyronine Stimulates the metabolism	[3],[16],[17]
T4	(4.5-12.0)µg/dl	Thyroxin produced by thyroid gland	
TSH	(6.3-5.5)µl/ml	Thyroid Stimulating Hormone pituitary hormone	

In our experiment we select data from Rahul thyroid diagnosis center and githubuci. All the dependable variables have definition with his explanation as like: Hyperthyroidism: Too much hormone production, Hypothyroidism: To little hormone production, Euthyroidism: The state of normal thyroid function. All the hormones (T3, T4 and TSH) define in with his evolution ranges in ng/dl, µg/dl and µl/ml. The values of T3, T4 and TSH mentioned in above table.1.

Algorithms Description: In this analysis developed model provides support to doctor in treatment. Proposed model is for consulting only doctors but final decision follow by doctors in treatment. Three classification algorithms J48,Random Tree and Hoeffding. Generate and combine model with carrying the majority by voting algorithms. Different varieties of seeds and portioned into different classes which is based on many features.

Random Tree: Random tree provide a platform for merging the individual learners. It constructs a random field of data for constructing decision tree. Every nodes of generated tree behaves as like best split for all variables and randomly choose best node. If we use random tree as a group of tree then it will be tree predictors or forest but all the mechanism follows the random trees and the outputs the class level has received the majority of votes. Random tree improve the performance of single decision tree and conscience more way of randomization[17-20].

J48: The generate the building model of thyroid data set classes by J48 algorithm from a set of records that contain class level. The decision tree find out the way of attribute direction behaves for all thyroid instances. By the help of this algorithm we will generate the rules for prediction for all target variables. The main objective of this algorithm in decision generation more progressive, decision tree and gain more accurate result by decision tree[21].

Hoeffding: Hoeffding decision tree algorithm support in generating stream. Now generate an incremental generating stream that will not be change over time [22].

Propose Method: This analysis uses algorithm for classification and prediction, by the help of these decision trees easily organize form of tree structure of thyroid dataset. Nodes of the tree shows the attributes of the dataset and edges will be use for represent the value of these attributes and finally find the leaf nodes as decision nodes. In propose model select women thyroid dataset from laboratories and after the preprocessing of missing values evaluate the correlation of attribute and take the values of T3, T4 and TSH then apply the algorithm in many faces of tree. Classify all thyroid dataset with different iteration of attributes and compare with tree ensemble model and finally evaluate the majority of voting for different classes of thyroid as like hyperthyroidism, hypothyroidism and euthyroidism.

Results and Discussion

Thyroid dataset in which 499 cases included as a record in csv file. The classification model has four attributes T3, T4, TSH. The target variables as a class level observation have three type of classes that are: hypothyroidism, hyperthyroidism and euthyroidism.

Some issues overcome in random split thyroid dataset in training and testing set. The randomsplits find contradiction between getting results and realistic results. In this paper, discuss and compare three tree algorithms with an ensemble model:

Experiment-I:

Table 2: Computational table for thyroid dataset using J48

Iterations	Batch Size	Confidential Factor	Min Num Obj	Num Folds	Seed	Accuracy	Time (in Second)
1	100	0.25	2	3	1	97.32	0.04
2	200	0.50	3	5	2	97.34	0.04
3	300	0.75	4	10	3	99.12	0.03

The role of J48 tree algorithm in thyroid dataset for different number of samples as like 100, 200 and 300, by the help of these batch prediction easily perform instances process. In this analysis observe confidential factor (0.25, 0.50 and 0.75) pruning and find minimum number of branches of instances in thyroid dataset experiment are 2, 3 and 4,. Analyze and discuss about controlling the sequences by number and reduce error pruning for randomize dataset. By the experiment it is clear that the default value of seed is 1, but select different sequence of random attributes by changing the seed 2 and 3. In this experiment find, if increase batch size (300), MinNumObj (4), Number of fold (10) and seed (3) then find highest accuracy (99.12%) with less time build model 0.03 seconds.

Experiment-II:

Table 3: Computational table for thyroid dataset using Random tree

Iterations	Batch Size	Confidential Factor	Min NumObj	Num Folds	Seed	Accuracy	Time (in Second)
1	100	0.25	2	3	1	93.67	0.02
2	200	0.50	3	5	2	93.67	0.02
3	300	0.75	4	10	3	97.59	0.02

The role of random tree algorithm in thyroid dataset for different number of samples. In this experiment find, if increase batch size (300), MinNumObj (4), Number of fold (10) and seed (3) then find highest accuracy (97.59%) with less time build model 0.02 seconds.

Experiment-III:

Table 4: Computational table for thyroid dataset using Hoeffding

Iterations	Batch Size	Confidential Factor	Min NumObj	Num Folds	Seed	Accuracy	Time (in Second)
1	100	0.25	2	3	1	89.31	0.07
2	200	0.50	3	5	2	89.22	0.07
3	300	0.75	4	10	3	92.37	0.05

The role of hoeffding tree algorithm in thyroid dataset for different number of samples. In this experiment find, if increase batch size (300), MinNumObj (4), Number of fold (10) and seed (3) then find highest accuracy (92.37%) hoeffding tree with less time build model 0.05 seconds.

Experiment-IV:

Table 5: Computational for thyroid dataset using Ensemble Model

Iterations	Batch Size	Confidential Factor	Min NumObj	Num Folds	Seed	Accuracy	Time (in Second)
1	100	0.25	2	3	1	98.43	0.05
2	200	0.50	3	5	2	98.43	0.05
3	300	0.75	4	10	3	99.20	0.05

The role of ensemble model in thyroid dataset for different number of samples. In this experiment find, if increase batch size (300), MinNumObj (4), Number of fold (10) and seed (3) then find highest accuracy (99.20%) with less time build model 0.05 seconds.

Table 6. Computational figure with table of thyroid dataset for comparing

Observations	Ensemble	J48	Random Tree	Hoeffding
Time Build Model	0.05	0.03	0.02	0.05
Accuracy	99.2	99.12	97.59	92.37
Seed	4	4	4	4
Num folds	10	10	10	10
Min Num Obj	4	4	4	4
Confidential Factor (%)	75	75	75	75
Batch Size	100	100	100	100

In the above all analysis of experiment I, II, III and IV, find the heighest batch size(300), confidental factor (75%), mnimum number of objects (4), number of folds (10) and seed (4) claculated heighest classification accuracy (99.2%). It is generated by Ensemble model of all given tree algorithms so majority of voting find that ensemble model of these tree algorithm is best. There is not major difference between generated time build models.

Conclusion

Hormones disorders in thyroid are a major problem in human. Various researchers work continues on this thyroid field and they used classification based data mining techniques. In this analysis used J48, Hoeffding and Random tree on thyroid dataset and identify more accurately model of decision tree on all possible experiments. In experimental study collect data from the values of T3, T4, TSH, Thyroid gland, Hyperthyroid, Hypothyroid and Euthyroidism at various levels and find (99.2%) classification accuracy in thyroid dataset. It is more accurate result of ensemble model compares the all other used tree algorithms with (0.05 seconds) time built model. Summaries all the experimental results and implement decision tree using more helpful data mining technique. In this analysis the ensemble classification technique improved evaluates accuracy and test thyroid dataset. In future work observe the identification of different affected factors of thyroid dataset and test more different and large dataset for diabetes, heart disease etc.

Ethical Clearance: No ethical clearance is needed for this research paper.

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Competing Interests: None declared

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A Descriptive Study to Assess the Knowledge on Child Birth Preparation among Primigravid Mothers in a Selected Tertiary Care Hospital at Kelambakkam, Kanchipuram District, Tamilnadu, India

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Abstract

A descriptive study to assess the knowledge on child birth preparation among primigravid mothers in a selected tertiary care hospital at Kelambakkam, Kanchipuram district, Tamil Nadu, India. The objectives are to assess the knowledge on child birth preparation among primigravid mothers in a selected tertiary care hospital at Kelambakkam, Kanchipuram district, Tamil Nadu, India. To find out the association between level of knowledge with demographic variables. The convenience sampling technique was used to select 41 samples. Validity and reliability data collection tools were established. The data were collected by self-administered questionnaires. The collected data were tabulated and analyzed. Descriptive and inferential statistics were used. The study shows that 2.5% of the women had adequate knowledge, 61% of the women had moderate knowledge, and 36.5% of the women had inadequate knowledge regarding child birth preparation.

Keywords: *Knowledge, Child birth preparation, Primigravid mothers.*

Introduction

Back Ground of the Study:

"Giving birth should be your greatest achievement not your greatest fear"

Birth preparedness is a strategy to promote utilization of maternal healthcare services and to ensure safe motherhood. Birth preparedness concept is based on the theory that preparing for childbirth and being ready to deal with complications reduces the delays in obtaining timely care and addressing the three delays of deciding to seek care, reaching health facility and receiving care[1].

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Pregnancy and giving birth to a child are normal physiological process, but the circumstances both internal and external, in which the child is conceived and born, affect the life of mother and child. Every pregnancy is associated with certain amount of unpredictability of risk of complication. Socio-cultural beliefs and lack of awareness in mothers and family members on how to recognize danger signs and symptoms, where to go when complication occurs, results in delay in seeking care and unprepared families waste time in recognizing problem, getting organized, getting money, finding transport and reaching the appropriate referral facility[2].

Ms. Supriyachinchpure (2015)

In spite of important progress towards attaining the Millennium Development Goals (MDGs), maternal and neonatal mortality continue to figure as major public health problems in developing countries[3,4]. Improvements in maternal health and reductions in maternal mortality have been slower than anticipated and–despite isolated successes–remain far from the

MDG5 target of a 75% reduction in the maternal mortality ratio (MMR) from 1990 to 2015[5]. Maternal mortality is a global burden, about 287,000 women died in 2010 due to pregnancy and childbirth related complications[6]. In India, Maternal Mortality Ratio is 212 per 100,000 live births[7].

Morbidities related to pregnancy are related to medical causes which goes uncounted. Most maternal death occurs during delivery due to unpreparedness for childbirth and managing complications, which results in delivery by the mother itself or untrained attendant. These maternal deaths are unjust and avoidable if preventive measures are taken on time like ensuring antenatal care to all mothers, delivery by skilled birth attendant and timely referral to hospital. As in most rural and tribal areas, delivery takes place at home, far from emergency obstetric services or without access to skilled attendant, there is more risk associated with mother and child life[8].

Many birth preparedness programs widely promoted by governments and international agencies to reduce maternal and neonatal health risks in developing countries; however, their overall impact is uncertain. Thus investigator felt need to assess whether pregnant women have adequate knowledge on antenatal, Intranatal and postnatal preparedness. **Dr. Alka Despande (2015)**

Research Methodology: A Quantitative approach with descriptive design was used in the study. The study was conducted among primigravid mothers attending OPD at selected tertiary care hospital. A purposive sampling technique was used to select 45 samples with the following inclusion criteria. Primigravid mothers who are willing to participate in the study and the mothers who all are attending Antenatal OPD.

Tool for the Study: Self-structured questionnaire used to elicit the demographic variables and to assess the knowledge on child birth preparation among primigravid mothers.

Scoring and Interpretation:

Score	Level of Knowledge
Above 75%	Adequate Knowledge
51-75%	Moderate Knowledge
Below 50%	Inadequate Knowledge

Study Findings: The majoriy (85.3%) of the mother is under the age group of 21-25 years, (78%) of the mother had married at the age of 21-25 years, (83%) of the mother were living in nuclear family, (85.3%) of the mother taking mixed diet, (83%) of the mother were living in the town, (48.8%) of the mother working as a professional, (58.6%) of the mother had monthly income of above Rs.15,000, (51.2%) of the mother were in second trimester.

The Chi-square association revealed there was no significant association between demographic variables in related with the knowledge aspects of primigravid mothers with aspects of knowledge on child birth preparation. It shows that there is no significant association between knowledge aspects with Age of the mothers (X^2=4.25), Age at marriage (X^2=1.48),Types of family (X^2=1.61), Dietary pattern (X^2=0.6), Area (X^2=4.63), Occupation (X^2=10.32), Monthly income (X^2=7.32). There is Significant Association Between Trimester (X^2=14.27).

Ethical Clearance:

Summary, Findings, Discussion, Implication, Limitataion, Recommendation And Conclusion.

The essence of any research project lies in reporting in the findings. This chapter gives a brief account of the present study including conclusion drawn from the findings, recommendations, limitation, suggestion for future studies and nursing implication.

Summary: The study is to assess the knowledge regarding child birth preparation among primi gravid Mothers attending antenatal OPD and ward at selected tertiary care hospital. This will enhance the primi gravid mothers to improve the knowledge regarding child birth preparation.

The objectives of the study were,

Assess knowledge on child birth preparation among primi gravid Mothers.

Associate the knowledge on birth preparation among primi gravid Mothers with selected demographic variables.

The study attempted to examine the following null hypothesis that

H_0: There is no significant association between demographic variables with the knowledge on child birth preparation among primigravid mothers in a selected

tertiary care hospital at Kelambakkam, Kanchipuram District, Tamil Nadu, India.

The review of literature enabled the investigator to develop methodology of the study literature review was done and organized as studies related to knowledge on child birth preparation among primigravid mothers.

The research approach used was quantitative approach with descriptive design. The main study was done in a selected tertiary care hospital at Kelambakkam, Kanchipuram District, Tamil Nadu, India. 41 samples were selected by convenience sampling.

The self-administered questionnaire was used to collect the data regarding demographic variables and the knowledge on child birth preparation among primigravid mothers. The data gathered were analyzed by using descriptive and inferential statistical method. The findings were presented on the basis of objectives of the study.

Findings: Findings of the study were presented under the following headings based on the study objectives

Objective 1: Assess the level of knowledge on child birth preparation.

The finding of the present study reveals that

1 (2.5%) had adequate knowledge

25 (61%) had moderate knowledge

15 (36.5%) had inadequate knowledge

OBJECTIVE 2: Associate demographic variables with the level of knowledge on child birth preparation.

Finding-1: Age and level of knowledge of child birth preparation.

There is no significant association between the age and level of knowledge of child birth preparation. X^2=4.25, (P<0.05).

Finding-2: Age at marriage and level of knowledge of child birth preparation.

There is no significant association between the age at marriage and level of knowledge of child birth preparation. X^2=1.48, (P<0.05).

Finding-3: Type of family and level of knowledge of child birth preparation.

There is no significant association between the type of family and level of knowledge of child birth preparation. X^2=1.61,(P<0.05).

Finding-4: Dietary pattern and level of knowledge of child birth preparation.

There is no significant association between the dietary pattern and level of knowledge of child birth preparation. X^2=0.6,(P<0.05).

Finding-5: Area and level of knowledge of child birth preparation.

There is no significant association between the area and level of knowledge of child birth preparation. X^2=4.63, (P<0.05).

Finding-6: Occupation and level of knowledge of child birth preparation.

There is no significant association between the occupation and level of knowledge of child birth preparation. X^2=10.32, (P<0.05).

Finding-7: Monthly income and level of knowledge of child birth preparation.

There is no significant association between the monthly income and level of knowledge of child birth preparation. X^2=7.32, (P<0.05).

Finding-8

Trimester and level of knowledge of child birth preparation.

There is significant association between the trimester and level of knowledge of child birth preparation. X^2=14.27, (P>0.05).

Implication: The findings of the study have implication in Nursing services and research.

Nursing Service: Community health nurse conduct educational programs to improve knowledge on child birth preparation.

In hospital Nurse can provide health education to create knowledge.

Limitation: Primigravid mothers only included in the study.

Recommendation: This study can be replicated an large sample studies can be conducted in different settings to validate findings

A similar study can be conducted on general public regarding child birth preparation.

Conclusion

Create awareness about child birth preparation. This study helps us to understand the need for child birth preparation to the primigravid mothers, it becomes necessary to involve the primigravid mothers as and when during pregnancy and it can also able to prevent the complications, miscarriage and fetal death during pregnancy.

Source of Funding: Self

Conflict of Interest: Nil

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Lateral Periodontal Cyst Masquerading Dentigerous Cyst: A Rare Case Report

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Abstract

Dentigerous cyst is the most commonly occurring developmental odontogenic cyst. Because of the typical clinical and radiologic attributes, the present case was clinically misdiagnosed as Dentigerous cyst which was later confirmed histopathologically as Lateral periodontal cyst. Lateral periodontal Cyst is defined as non-keratinized developmental cyst located lateral to the root of a vital tooth. This case report presents a unique case of lateral periodontal cyst present in 58-year-old female patient. Atypical presentation of lateral periodontal cyst as is presented in this case report should be considered by the histopathologist while interpreting microscopic preparations of odontogenic cysts.

Keywords: *Lateral periodontal Cyst; Dentigerous cyst; Histopathology; Orthopantomograph.*

Introduction

Lateral periodontal Cyst (LPC) is defined as non-keratinized developmental cyst located lateral to the root of a vital tooth. This cyst is most frequently associated with mandibular premolars but has been reported to occur at the other areas.[1] Since pain or other clinical symptoms have seldom been reported, the lesion is often discovered on routine radiographic examination. Radiographs of the lateral periodontal cyst show a well-circumscribed round or ovoid radiolucent area, usually with a sclerotic margin. Most of them are less than 1 cm in diameter.[1-4] Owing to the common prevalence of dentigerous cyst among developmental odontogenic cyst, radiological presentation of unilocular radiolucency circumscribing crown of impacted supernumeraries are usually diagnosed as dentigerous cysts. This article reports a classic case of Lateral periodontal cyst which was clinically diagnosed as dentigerous cyst along with a brief literature on the clinical, radiological and histopathological features of LPC.

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Case Report: 58-year-old female patient reported with the chief complaint of mild pain and swelling in the lower left back tooth region with oozing of pus for 5 days (Figure 1). Patient gives a history of extraction of lower left second premolar one year back. Intra oral examination reveals an intraoral sinus with respect to 36. Orthopantomograph revealed four supernumerary impacted teeth in the lower left pre molar region with unilocular radiolucency encircling the crown of impacted teeth and involving the root of 34 (Figure 2).A provisional diagnosis of infected dentigerous cyst was given.Microscopic sections(Figure3) of the submitted biopsy specimens showed non keratinized squamous epithelial lining of uneven thickness supported by delicately collagenous connective tissue wall, which is infiltrated with minimal focal collection of chronic inflammatory cells. At areas focal nodular thickening of epithelial cells with many glycogen rich clear cells is observed. Connective tissue wall shows evidence of daughter cysts. Histopathological diagnosis was conclusive of lateral periodontal cyst.

Discussion

LPC is considered as developmental odontogenic cyst which represents approximately 0.8% to 2% of all odontogenic cysts which is most of the time identified in routine radiographic examination.[5,6] The LPC was described for the first time by Standish and Shafer in 1958.[7] In the year 1973, Wysocki et al. considered it as a representation of intrabony counterpart of the gingival cyst of adults. In the same year, Weather and Waldron reported for the first time an unusual form of the LPC called Botryoid Odontogenic Cyst owing to its appearance as a bunch of grapes.[8] Wysocki et al. suggested that the polycystic variant of LPC formed through cystic transformation of multiple islands of dental lamina and some authors consider it to originate from fusion of adjacent multiple LPCs.[9]Literature review shows that the LPC is more prevalent in adults in the 5th - 7th decades of life with mean age of 52 years, without preference for race or sex. The most frequently reported location of LPC is the mandibular premolar area. In most cases the LPC does not present distinctive clinical symptoms, the associated teeth are vital, unless secondarily infected.

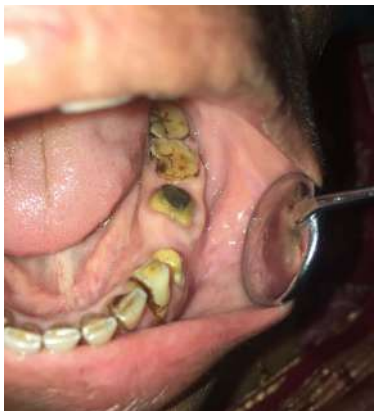

Figure 1: Mild swelling in relation to 36 and missing 35

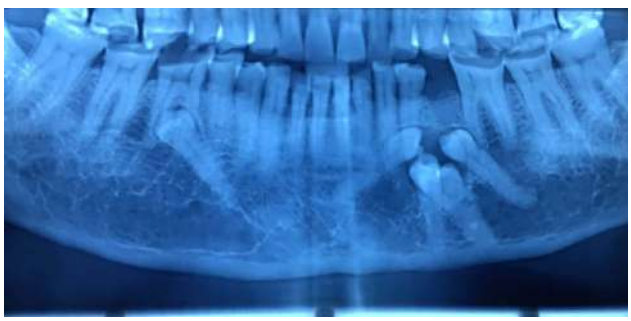

Figure 2: Orthopantomograph reveals unilocular radiolucency encircling the crown of impacted supernumerary teeth in the lower left pre molar region

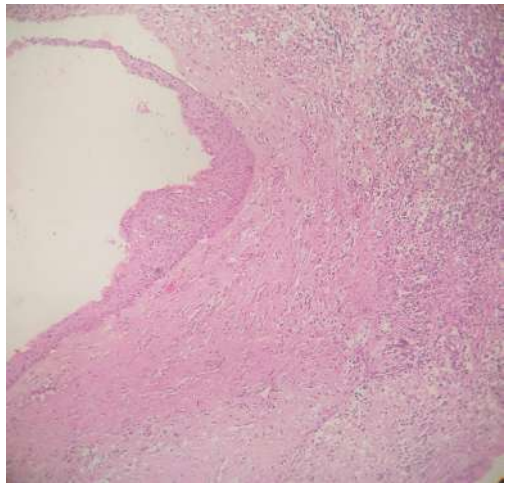

Figure 3: Microscopic features (10X) show focal nodular thickening of epithelium with many glycogen rich clear cells

The pathogenesis of LPC may be related to the three aetiopathological hypotheses: reduced enamel epitheliumremnants of dental lamina and cellular remnants of Malassez.[5,6,10] The first hypothesis is that the cyst is lined by non-keratinized epithelium reminiscent of the reduced enamel epithelium which is supported by PCNA immunohistochemical expression. The second theory is related to dental lamina remnants, because LPC histopathologically presents glycogen-rich clear cells, which is also seen in the dental lamina. The third hypothesis offered that the epithelial remnants of Malassez presented in the roots surface, principal location of the LPC, play a role.

The diagnosis of LPC should be restricted to cysts that are in the periodontal side. Radiographically, the orthopantomograph represents four supernumerary impacted teeth in the left lower premolar region with unilocular radiolucency encircling the crown of impacted tooth and involving the root of vital tooth of first premolar region. The periodontal ligament space as a rule is not enlarged and there must not be a communication between the cyst's cavity and the oral environment.[1,10,11] Occasionally, LPC may be multicystic, and called as odontogenic botryoid cyst due to macro- and microscopic features resemble to "bunch of grapes" (from the Greek word "botrios"). [10,11]

The radiographic features may be inconclusive relative to the diagnosis. Other interradicular radiolucencies must be distinguished from the LPC: anatomic radiolucencies, such as the mental foramen, maxillary sinus and the nutrient canals; cyst of pulpal

origin, other cysts of the jaws, odontomas and other tumours. It may resemble a cyst that develops laterally through a side channel accessory in a non-vital tooth.[11] The histopathology revealed that LPC is a developmental cyst characterized by a thin layer nonkeratinized stratified squamous epithelium of with uneven thickness supported by delicately collagenous connective tissue wall, which is infiltrated with mild focal collection chronic inflammatory cell infiltration.

At focal areas thenodular epithelial thickening, referred to as plaques or theca, are commonly found and composed of the clear fusiform cells rich in glycogen. However, it is possible to observe the histopathological variant of LPC - botryoid cyst, that should receive a greater attention considering the rate of recurrence and unusual presentation.[12-16.] The botryoid cyst represents a histopathological variant which presents with multilocular cystic "grape-like" appearance inside the bone. Histopathological findings show multiple cystic spaces lined by nonkeratinized stratified squamous epithelium.[12,15,16] The mobility of mandibular lateral incisor and canine reported by the patient can be justified by the cyst growth. However, LPC does not reach proportions that are larger than 1 cm while cysts of inflammatory origin tend to grow continuously.[13,15,17] In cases of a vital tooth, LPC can still be clinically confused with cysts that develop in inflammatory processes in cases of advanced periodontal disease, where the presence of periodontal inflammation stimulates epithelial proliferation. In most cases the differential diagnosis must be established with radicular cysts, in a view of their high frequency. These lesions are characterized by necrosis of the affected tooth, as a result of which vitality testing proves negative. Follicular or dentigerous cysts are always associated to an impacted tooth (particularly a lower third molar), while primordial cysts are mostly located in the ascending mandibular ramus. Authors suggest the investigation of the possibility of LPC causing isolated bone defects.[15,16]

The common treatment modality for LPC includes enucleation of the cyst in toto.[16,18] In general, LPC has a low rate of recurrence from 3 to 4% hence, long-term follow-up is necessary.

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Conflicts of Interests: No conflicts of interests.

Ethical Permission: Not required.

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Investigation of a Food Poisoning Outbreak in a Private Hostel in Kanchipuram District, Tamilnadu

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Abstract

Food borne disease can be defined as any disease of an infectious or toxic nature caused by the consumption of food or water(1). The investigation was carried out after receiving information on food poisoning cases from the RMO of SMCH among the inmates of a private women's hostel.

Methodology: Epidemiological case sheet was prepared and details from the affected individuals were obtained. On the same day, the kitchen and the mess were inspected and food handlers were examined.

Findings of the Outbreak: During the investigation, it was found that among the 120 inmates who consumed the dinner, 79(65.8%) inmates developed symptoms of food poisoning and 41(34.2%) inmates did not develop any symptoms. Diarrhea, abdominal pain, fever, headache, nausea and vomiting were the symptoms and the incubation period ranged between 3–38 hours.

Among those who developed symptoms, 30(37.9%) inmates were hospitalised for conservative management while 49(62.1%) inmates rested in the hostel, resorted to self medications. All of them completely recovered within 3 days.

Conclusion: Curd rice is the food item suspected to be contaminated and probable source for food poisoning outbreak. Based on the signs and symptoms of the inmates, incubation period ranging between 3–38 hours, enquiry findings and clinical examination of the employees presumably the suspected causative agent of the outbreak could be due to Salmonella.

Keywords: *Food poisoning, Outbreak investigation, Attack rate, Attributable risk.*

Introduction

Food poisoning is an acute gastroenteritis caused by ingestion of food or drink contaminated with either living bacteria or their toxins or inorganic chemical substances and poisons derived from plants and animals(2). Outbreaks of food poisoning commonly occur in closed communities where food is prepared and served centrally for a sizable population(3). Outbreaks of food poisoning are recognized by a large number of persons affected at the same time, similarity of signs and symptoms and history of ingestion of common meal(4). As people increasingly consume food prepared outside the home, growing numbers are potentially exposed to the risks of poor hygiene in commercial food service settings(5).

Methodology: The investigation was carried out after receiving information on food poisoning cases from the RMO of SMCH among the inmates of a private women's hostel.

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Verification of the Diagnosis: The illness was confirmed by the doctor at the hospital and based on their symptoms; preliminary case history the investigation was done.

Confirmation of the Outbreak: The information on symptoms and type of food consumed was gathered from the patients at the hospital. On the same afternoon, the two women's hostels were visited and details from all individuals who had taken food in the mess were obtained. On the same day, the kitchen and the mess were inspected and clinical examination of food handlers was conducted.

Description of Cases in terms of Time, Place, and Person: A case is defined as gastrointestinal illness in any resident of the hostel who as a previously well individual developed diarrhea or vomiting with or without abdominal pain, fever, headache within two days of consuming food in the hostel mess.

Epidemiological case sheet was developed; through interview method the details on demographic information, food items eaten, quantity of food consumed, time of exposure, presenting symptoms, time of onset of initial symptom and time of reporting, treatment and history of consumption of water or food outside the mess and were obtained from the inmates.

Survey was undertaken to assess the hygiene and sanitation of the kitchen. Details of food processing, food preparation and storage of prepared food were ascertained by interviewing food handlers. Medical examination of food handlers was conducted.

Sample Handling and Processing: Stool samples were collected from those consented for the microbiological examination. Food samples were not available for analysis. Water (drinking, cooking purposes) from the premises of both the hostels; mess and kitchen were collected and analyzed for residual chlorine and bacteriological examination.

Data Analysis: Data analysis was done using SPSS 16.0 version. Attack rate, Relative risk and Attributable risk were calculated for each food item to establish an association with the illness.

Results and Discussion

During the investigation, it was found there were 530 inmates in the Hostel–I. As it was festival holidays, 136 of them remained in the hostel. The mean age of the subjects was 22 years; ranged between 18–30 years and all belonged to upper middle class. Among those who remained in the hostel, 126 inmates consumed food served in the mess while 10 inmates did not consume food in the mess.

Among those who consumed food in the mess, 120 inmates consumed dinner on 15 January 2018; 79(65.8%) inmates developed symptoms of food poisoning while 41(34.2%) inmates did not develop any symptoms. Only breakfast was consumed by 6 inmates served on 16 January 2018 and did not develop any symptoms. The detail of population at risk is given in Figure 1.

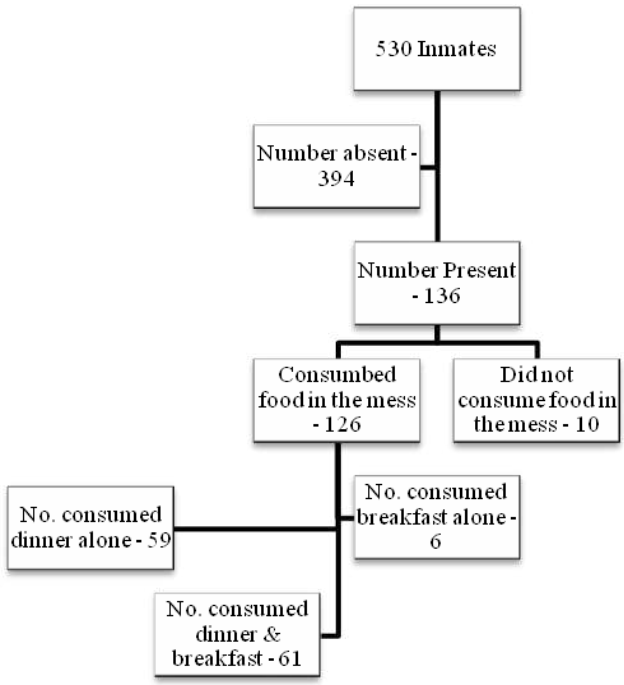

Figure 1: Detail of population at risk

Dinner, breakfast prepared in the common kitchen are sent to the mess of two hostels. However symptoms of food poisoning were reported only by the inmates of Hostel–1 while the inmates from Hostel–2 did not report any symptoms.

Diarrhea, abdominal pain, fever, headache, nausea and vomiting were the symptoms suffered by the subjects after the consumption of food and details are given in Table 1. Incubation period ranged between 3–38 hours[6] and median incubation period was 16 hours.

Table 1: Details of symptoms suffered by the inmates of Hostel-1

S.No	Symptoms	Frequency (N=126)*	Percentage (%)
1	Diarrhoea	79	62.7
2	Fever	59	46.8
3	Vomiting	51	40.4
4	Abdominal Pain	39	31
5	Nausea	19	15.1
6	Headache	17	13.5

*Mutliple responses for each variable–hence percentage will not sum up to 100%

The suspected primary case consumed the food at 7PM and developed symptoms at 10PM; incubation period of 3 hours. The subject complained of passing loose stools–10 episodes, watery, not mixed with mucus, not blood stained, vomited food particles (1 episode), high grade fever associated with chills and abdominal pain, got admitted on 16th January at 9.30PM

The index case consumed the food at 7PM and developed symptoms at 9AM; incubation period of 14 hours. The subject complained of passing loose stools–4 episodes, watery, not mixed with mucus, not blood stained, vomited food particles (3 episodes), high grade fever associated with chills, got admitted on 16th January at 4PM.

Epidemic curve of the outbreak investigation showed a "common vehicle point exposure"[7] curve typical of food poisoning is given in Figure–2.

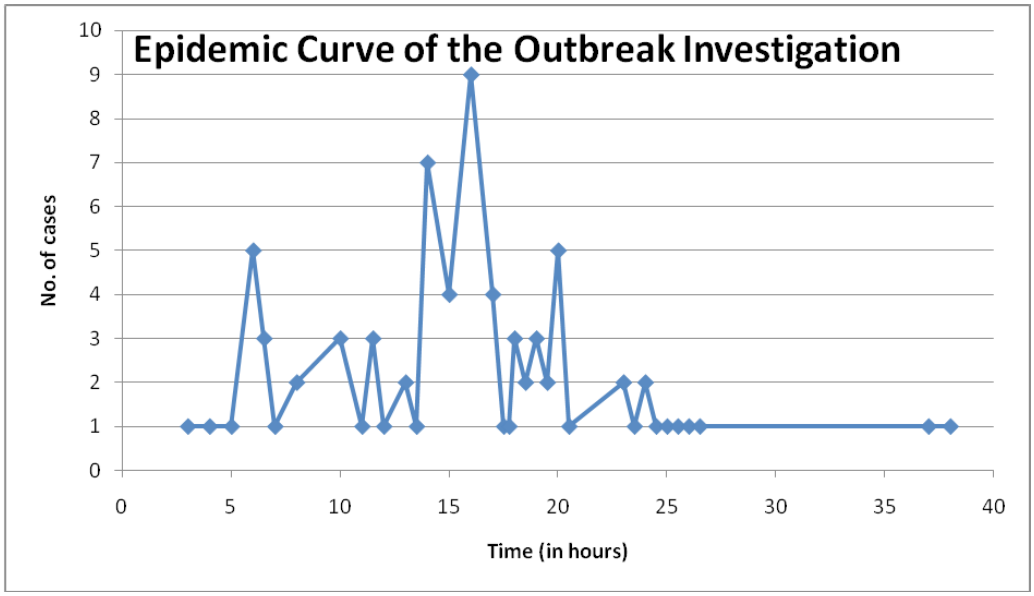

Figure 2: Epidemic curve of the outbreak investigation

Among those who developed the symptoms, 30(37.9%) inmates were hospitalised for conservative management while 49(62.1%) inmates rested in the hostel, resorted to self medications. All of them completely recovered within 3 days. Stool examination (only four patients consented)–there was no ova/cyst.

Dinner comprising of tomato rice, curd rice, egg, kuruma was served between 7PM–9PM and breakfast comprising of uppuma, coconut chutney was served between 7AM–9AM. Tomato rice, kuruma, egg was prepared at 3PM; stored for 4 hours while curd rice was prepared at 5PM; stored for 2 hours. Uppuma, coconut chutney was prepared at 5AM; stored for 2 hours. Food prepared in common kitchen was distributed in trolleys in closed containers to the serving area. Food was not re–heated before serving.

The main course of the dinner was served by a staff employed in the mess while the other items of the platter were self served by the inmates using a common laddle. However, according to the food handlers they wear aprons and caps while cooking or dispensing food. The details of risk estimation are given in Table 2.

Table 2: Details of Estimation of Risk of the Population at Risk (N = 126)

Food Item	Consumed			Not Consumed			Relative Risk (95% CI for RR)	Attributable Risk
	Total consumed	Symptoms Present	Attack Rate	Total not consumed	Symptoms Present	Attack Rate		
	N*	N*	%	N*	N*	%		%
Tomato rice	112	71	63.4	14	8	57.1	1.109 0.690–1.784	9.9
Curd rice	75	63	84	51	16	31.4	2.678 1.763–4.066	62.6
Egg	64	44	68.8	62	35	56.5	1.218 0.926–1.602	17.8
Kuruma	63	42	66.7	63	37	58.7	1.135 0.866–1.488	11.9
Uppuma	67	46	68.7	59	33	55.9	1.227 0.929–1.621	18.6
Coconut chutney	35	24	68.6	91	55	60.4	1.135 0.858–1.500	11.9

*Mutliple responses for each variable

Inspection of the kitchen: Kitchen is located 100 metres away from both the hostels. Water–RO supply (cooking) is present, maintenance is done once in a fortnight.

Separate store area is present near the kitchen where the vegetables, groceries are stored. Refrigerator is available to store dairy products but temperature log is not maintained.

Liquid waste disposal and solid waste disposal are indiscriminate. Flies nuisance are present. Separate wash area for cleaning vessels is present, which was found to be untidy.

Inspection of the mess of both the hostels: Separate serving areas are present with adequate lighting and ventilation. The floor and walls are clean. Tables, chairs are adequate and clean. Plates are cleaned and stacked up in the stand. Drinking water (RO supply) is present and the maintenance is done once in a fortnight.

Separate store area is present in the mess where dry items like pickles, papads are stored Separate wash area for washing hands, plates, vessels is present and it is clean.

Water (drinking and cooking purposes) collected from the premises of both the hostels; mess and kitchen were sent for microbiological analysis. There was no growth after 3 days in the water samples. Food samples were not available for analysis.

Clinical examination of the food handlers: Cook and the person who served the food in the mess were employed for the past 1 year and the details of clinical examination are given in Table 3.

Table 3: Details of clinical examination of the food handlers

Characteristic	Details of the Cook	Details of the food handler
Personal Habits	Satisfactory	Satisfactory
Personal history	Smoking, alcohol consumption, Use of pan present	Smoking, alcohol consumption, Use of pan present
General examination	Satisfactory	Satisfactory
Clinical findings suggestive for infections	None	None
Last medical check up	Not aware	Not aware

Possible Diagnosis: Curd rice is suspected to be the probable source for food poisoning outbreak. (Attack rate = 84%, relative risk = 2.678, 95% CI for RR (1.763–4.066) and attributable risk = 62.6%). As the inmates in hostel–2 were symptom free, probable source of contamination could be at the distribution system or where the food was served.

Given the signs and symptoms, incubation period ranging between 3–38 hours, enquiry findings, clinical examination of the employees presumably the suspected causative agent of the outbreak could be Salmonella[8,9]

Conclusion

Food poisoning outbreaks are common when adequate measures of food safety guidelines are not followed. Due to the lack of appropriate samples, causative organism could not be isolated. However, clinico epidemiological evidence is suggestive of Salmonella. This investigation revealed it is essential to lay emphasis on food hygiene, adequate and proper storage, education of food handlers on food handling techniques, safe distribution system, and improved sanitary conditions with scrupulous surveillance systems.

Ethics Clearance: Obtained from the Institutional Ethical Committee of Saveetha Medical College

Source of Funding: Self

Conflict of Interest: None

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A Review on Process of Data Mining Approaches in Healthcare Sectors

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Abstract

Data Mining is one of the foremost motivating areas of research that is become additional and more wide unfolds in health organization. Processing plays an awfully vital role for uncovering new trends in health care organization that in turn helpful for all the parties associated with this field. This survey explores the utility of various processing techniques like classification, clustering, association, regression in health domain. Throughout this paper, we have a tendency to tend to gift a brief introduction of these techniques and their blessings and drawbacks. This survey together highlights applications, challenges and future issues with processing in health care. Recommendation with reference to the suitable choice of accessible processing technique is in addition mentioned throughout this paper. A Clinical information Repository will be used within the hospital setting to trace prescribing trends in addition as for the looking of infectious diseases. One area CDR's would possibly likely be used is looking the prescribing of antibiotics in hospitals significantly as a result ofthe range of antibiotic- resistant microorganism is ever increasing. In 1995, a study at the letter Israel deacon centre conducted by the Harvard graduate school used a CDR to observe antibiotic use and prescribing trends since vancomycin-resistant enterococci is also a growing draw back. They used the CDR to trace the prescribing by linking the individual patient, medication, and thus the biology science laboratory results that were all contained at intervals the CDR.

Keywords: *Data Mining, Classification, Clustering, Association, Healthcare.*

Introduction

Data Mining is one in all the foremost very important and motivating space of analysis with the target of finding purposeful data from Brobdingnagian knowledge sets. In gift era, data processing is changing into fashionable in attention field as a result of there's a requirement of economical analytical methodology for detective work unknown and valuable data in health knowledge.

According to ***DiviyaTomar and Sonaliagarwalet, al., 2013***, in health business, data processing provides many advantages like detection of the fraud in insurance,accessibility of medical answer to the patients at lower value, detection of causes of diseases and identification of medical treatment strategies. It additionally helps the attention researchers for creating economical attention policies, constructing drug recommendation systems, developing health profiles of people etc. the information generated by the health organizations is incredibly large and sophisticated owing to that it's troublesome to investigate the information so as to createvital call relating to patient health[1].

Data processing techniques {are also accustomed analyze the varied factors that are liable for diseases as an example kind of food, completely different operating atmosphere, education level, living conditions, accessibility of pure water, health care services, cultural, environmental and agricultural factors.

Data Mining: Data Mining came into existence

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within the middle of 1990's and appeared as a strong tool that's appropriate for attractive antecedently unknown pat larid and helpful data from Brobdingnagian data set[2]. Numerous studies highlighted that data processing techniques facilitate information holder to investigate and find out unexpected relationship among their data that successively useful for creating call[3].

In general, data and information Discovery in Databases (KDD) area unit connected terms and area unit used interchangeably however several researchers assume that each terms area unit completely different as data processing is one in every of the foremost necessary stages of the KDD process In line with Fayyad et al., the information discovery method area unit structured in numerous stages wherever as the primary stage is information choice where information is collected from numerous sources, the second stage is pre - process of the chosen information, the third stage is that the transformation of the info into applicable format for additional process, the fourth stage is data processing wherever appropriate data processing technique is applied data for extracting valuable information and analysis is that the last stage as shown in Figure 1[4].

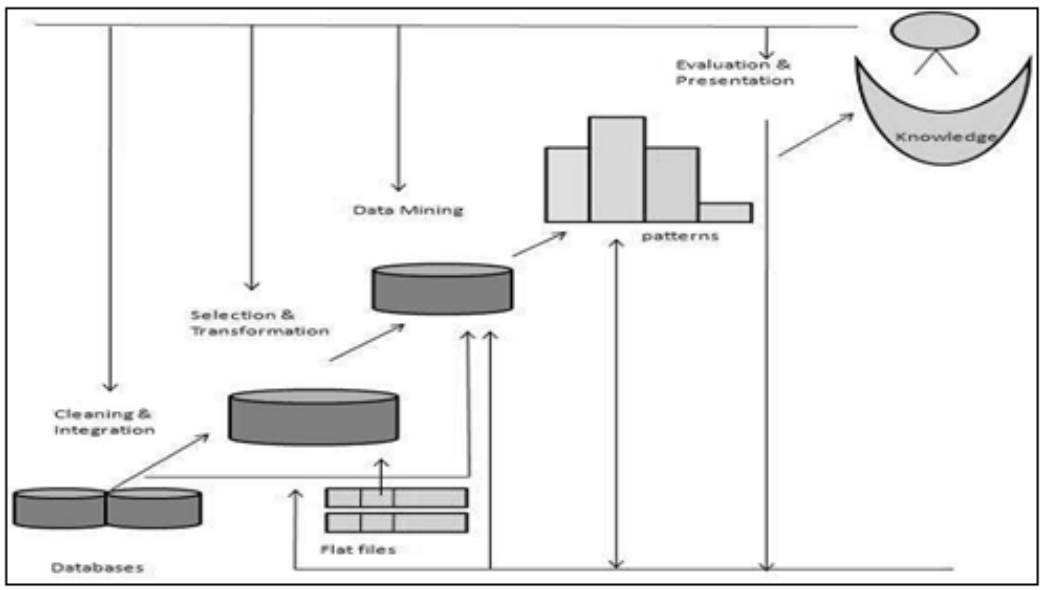

Figure 1: Stages of Knowledge Discovery Process

Skills and data are essential demand for performing arts the info Mining task as a result of the success and failure of knowledge Mining comes is greatly addicted to the one who ar managing the method as a result of inconvenience of normal framework[5]. CRISP-DM (CRoss trade normal method for data processing) provides a framework for concluding information Mining activities. CRISP-DM divides the info mining task into six phases[6]. The primary part is that the understanding of the business activities whereas the info for concluding business activities are collected and analyzed within the second part[7]. Information pre-processing and modelling is completed within the third and fourth part severally. Fifth part evaluates the model and last part is to blame for preparation of the construed model. McGregor et al., projected associate extended CRISP-DM framework for up clinical care through group action the temporal and flat aspects [8].

In gift era varied public and personal tending institutes square measure manufacturing hugeamounts of information that square measure troublesome to handle. So, there's a desire of powerful machine-driven data processing tools for analysis and deciphering the helpful info from this knowledge[9].

Classification: Classification divides information samples into target categories. The category technique predicts the target class for every information points. for instance, patient are often classified as "high risk" or "low risk" patient on the idea of their sickness pattern exploitation information classification approach[10].

It's a supervised learning approach having best-known category classes. Binary and construction area unit the 2 ways of classification. In binary classification, solely 2 potential categories like, "high" or "low" risk patient is also thought-about whereas the multiclass approach has over 2 targets for instance, "high", "medium" and "low" risk patient. information set is divided as coaching and testing dataset.

K-Nearest Neighbour (K-NN): K-Nearest Neighbour (K-NN) classifier is one in all the only classifier that discovers the unidentifiedin formation exploitation the antecedently best-known information points (nearest neighbour) and classified information points in keeping with the legal system . K-NN classifies the information points exploitation over one nearest neighbour[11]. K-NN contains a range of applications in numerous areas like health datasets, image field, cluster analysis, pattern recognition, on-line selling etc. Jen et al., used K-NN and Linear Discriminate Analysis (LDA) for classification of chronic sickness so as to come up with early warning system.

Decision Tree (DT): DT associate degree alogous to the flow chart within which each non-leaf nodes denotes a check on a specific attribute and each branch denotes an outcome of that check and each leaf node have a category label. The node at the highest most labels within the tree is named root node. For instance we've a financial organization call tree that is employed to choose that someone should grant the loan or not. Building a call for any drawback does not would like any variety of domain data. call Trees could be a classifier that use tree-like graph. The foremost common use of call Tree is in research analysis for shrewd conditional chances[12].

The additional improvement of the prevailing call tree model to classify totally different activities of patients in additional correct manner. Within the similar domain, Moon et al. exemplify the patterns of smoking in adults victimization call tree for higher understanding the health condition, distress, demographic and alcohol . Chang et al., additionally used associate integrated call tree model for characterize the skin diseases in adults and kids.

Support Vector Machine (SVM): The thought of SVM that is predicated on applied math learning theory . SVMs were at the start developed for binary classification however it may well be with efficiency extended for multiclass issues . The support vector machine classifier creates a hyper plane or multiple hyper planes in high dimensional house that's helpful for classification, regression and different economical tasks[13].

SVM have several engaging options owing to this it's gaining quality and have promising empirical performance used SVM classification approach for classification of assorted diseases and SVM along side k-meansbunch was applied on microarray information for distinctive the diseases. SVM is one amongst the foremost widespread approaches that area unit utilized by scientist in attention field for classification. Fei planned Particle Swarm improvement SVM (PSO-SVM) approach for analyzing heart disease and build a prophetical model for carcinoma designation exploitation hybrid SVM primarily based strategy.

E.Avci planned a system exploitation genetic SVM classifier for analyzing the center valve malady. this technique extracts the vital feature and classifies the signal obatined from the ultrasound of heart valve.

An ensemble neural network methodology is planned by Das et al., for diagnosing of cardiovascular disease so as to develop effective call network used ANN for locating the respiratory organ diseases. This analysis work analyze the chest computed axial tomography (CT) and extract important respiratory organ tissue feature to cut back the information size from the Chest CT and so extracted matter attributes got to neural network as input to get the assorted diseases relating to respiratory organ .

Clustering: Clustering is associate unattended learning methodology that's completely different from classification. Clump is not like to classification since it's no predefined categories. In clump massive info square measure separated into the shape of tiny completely different subgroups or clusters[14]. Clump divided the information points supported the similarity live. Clump approach is employed to spot similarities between information points. Every information points at intervals an equivalent cluster square measure having bigger similarity as compare to the information points belongs to alternative cluster.

Partitioned clump: In this clump methodology the information sets having 'n' data points divided into 'k' teams or clusters. Every cluster has a minimum of one datum and every datum should belong to only 1 cluster. During this clump approach there's a necessity to outline the quantity of cluster before partitioning the

datasets into teams. supported the selection of cluster centre of mass and similarity live, partition clump methodology is split into 2 categories-K-means and K-Mediods. K-Means clump approach is one among the foremost wide used approach that partition the given 'n' information points into 'k' cluster supported similarity live in such the simplest way that information points belong to an equivalent cluster have high similarity as compare to the information points of alternative cluster . It initial selects the k-centroid willy-nilly so assign the information points to those 'k' centre of mass supported some similarity live. for each iteration, a knowledge purpose is handed over to the cluster supported similarity of cluster mean (the distance between the information points) . The most recent mean is calculated and this step is recurred to accommodate each freshly arrived information points.

Density primarily-based agglomeration: The problem with partition and hierarchical agglomeration technique is that they'll handle solely spherical formed cluster and don't seem to be appropriate for locating cluster of whimsical shapes.

Density agglomeration ways take away this downside and expeditiously handle outliers and whimsical formed cluster[15]. DBSCAN and OPTICS area unit 2 approach of Density primarily based agglomeration that discover cluster on the idea of density property analysis. DENCLUE is another approach of density primarily based agglomeration ways that kind the grouping of knowledge points on the idea of distribution price analysis of density operate .

Association Association is one in every of the foremost very important approach of information mining that's accustomed establish the frequent patterns, fascinating relationships among a of information things within the data repository. it's additionally referred to as market basket analysis as a result of its capability of discovering the association among purchased item or unknown patterns of sales of consumers in an exceedingly group action info. for instance if a client is shopping for a pc then the prospect of shopping for antivirus software system is high. This info helps the merchandiser to more enhance their sales[16]. Association additionally hasnice impact within the aid field to observe the relationships among diseases, health state and symptomsused Apriori, prophetical apriori for generating the principles for heart condition patients. during this analysis work rules square measure created for healthy and sick folks. supported these rules, this analysis discovered the factors that cause heart downside in men and girls. when analyzing the principles authors conclude that girls have less chance of getting coronary heart condition as compare to men .

Data Mining Challenges in Healthcare: One of the foremost important challenges of the information mining in health care is to get the standard and relevant medical data. It's troublesome to accumulate the precise and complete health care information. Health information is advanced and heterogeneous in nature as a result of it's collected from varied sources like from the medical reports of laboratory, from the discussion with patient or from the review of doctor. For health care supplier, it's essential to keep up the standard of information as a result of this data is beneficial to supply value effective health care treatments to the patients. Health Care finance Administration maintains the minimum information set (MDS) that is recorded by all hospitals. In MDS there square measure three hundred queries that square measure answered by the patients at arrival time. However this method is advanced and patients face downside to retort the complete queries. So, it's essential to keep upthe standard and accuracy information for data processing to creating effective call.

Conclusion and Future Issues

The purpose of this section is to produce AN insight towards needs of health domain and regarding appropriate selection of obtainable technique. Following ar the rule for exploitation totally different data processing techniques:

- Before applying classification technique there's a necessity to acknowledge the redundant and inappropriate attributes as a result of these attributes act as a noise and outlier that successively hamper the process task.
- These attributes conjointly had AN adverse have an effect on the performance of classifier. Applied mathematics ways are used for recognizing these attributes. On the opposite hand the foremost relevant and helpful attributes is recognized by feature choice ways that successively enhance the performance and accuracy of classification model.
- We have a tendency to conjointly analyzed that there's no single classifier that turn out best result for each dataset. So as to examine the performance of classifier, a dataset is split into 2 parts-coaching and testing. So, a classifier is chosen only if it turn

out higher performance among all classifiers. The performance of a classifier is evaluated exploitation testing knowledge set.

- However there is drawback with testing knowledge set. It slow it's complicated and a few time it becomes simple to classify the testing knowledge set. The performance of classifier depends on testing knowledge set.
- To avoid these issues we are able to use cross validation technique so each record o f information set is employed for each coaching and testing.

Ethical Clearance: Since the article is based on review studies there is no need of clearance.

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Prevalence of Musculoskeletal Pain among Manual Drummers and Electric Pad Drummers

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Abstract

Background: Work-related musculoskeletal problems exists almost in every areas that cause pain, disability and loss of employment . Although performing arts medicine is a growing field, the health problems of musicians remain under-recognized and under-researched. In order to play their instrument, musicians need to frequently repeat physically strenuous movements which has a dramatic impact on physical mobility and function. Musculoskeletal problems among instrumental musicians are common which occurs in both men and women. This study examines professionals who play musical instruments especially drums who are potentially at risk of developing problems, including pain and injuries related to their playing activities.

Objective: To find out the prevalence of musculoskeletal discomfort among manual drummers and electric pad drummers.

Study Design: Observational study design, comparative type.

Procedure: 60 subjects were selected based on inclusion and exclusion criteria and among them 30 manual drummers and 30 electric pad drummers were seggregated into two groups, aged between 15-35 years of both men and women were given a format of Musculoskeletal Pain Intensity And Pain Interference Questionnaire for Musicians (MPIPIQM) which depicts the prevalence of both pain intensity and interference of drummers.

Results: Results were analysed the IBM SPSS version 20 software. The statistical tool used in the study was the WILLCOXON SIGNED RANKS TEST to compare both the group data which gives the mean value of 5.45 for manual drummers and the mean value of 1.97 for the electric pad drummers pain intensity and interference score.

Conclusion: The study concludes that the manual drummers have more pronounced musculoskeletal pain intensity and interference when compared to that of the electric pad drummers.

Keywords: *Musicians, Musculoskeletal problems, Pain intensity and Pain Interference Questionnaire, Drummers.*

Introduction

Music is the most essential ingredient of any entertainment. In order to create successful entertaining event musicians plays an imperative role. Musicians are enchanters who spread the fragrance of joy by absorbing woes, in the form of Playing Related Musculoskeletal Disorders (PRMDs), for themselves. Most professional classical musicians will suffer at some time during their career from a musculoskeletal disorder (MSD). As many as 12% of them have been reported to give up their profession permanently.

Like other occupations, musicians also suffer from work related musculoskeletal disorders which are often disabling [1,2] Since the occupation of instrumental musicians involves playing musical instruments, therefore, work related musculoskeletal disorders are called as Playing Related Musculoskeletal Disorders (PRMDs)[3.]

Playing musical instrument requires technical precision, repetitive and striking movements and is often performed in constrained posture for longer period of time[1,5.] All types of instrumental musicians (string,

drums, woodwind, brass and percussionists) are prone to Playing Related Musculoskeletal Disorders .[6]A high prevalence of work-related musculoskeletal disorders has been found in musicians, ranging from 73.4% to 87.7%.[7]

The term "Musculoskeletal disorders"includes wide range of inflammatory and degenerative condition affecting the muscles,tendons,ligaments,joints,periphe ral nerves and supporting blood vessel. These include clinical syndromes such as tendon inflammation and related conditions and standardized conditions such as myalgia, low back pain, and neck pain.

Musculoskeletal disorders are put into different categories according to pain location. One category is upper limb disorders which includes any injury or disorder located from fingers to shoulder or the neck. Another category is lower limb disorders which include injury and disorders from hip to toe.

Drummers represent one of the largest and fastest growing among professional musicians. The drum is the member of the percussion group of musical instruments. Playing drums requires effort, speed and highly repetitive movements. Drumming is a very demanding and dynamic activity requires a tremendous amount of muscle conditioning, endurance, strength and coordination.

Learning to play a musical instrument is one of the most complex tasks that the human body can perform with muscles, joints and nerves often operating above its normal capacity.

To become a professionalist in drumming it needs long hours of practice and should perform the same repetitive activity over and over again to develop the necessary muscle memory to perform night after night.

Risk factors for drumming-related musculoskeletal disorders include high repetition, high force, and other factors, such as vibration.Drums is usually played by striking with the hand or with one or two sticks. Drums are of two types' manual drums and electric pad drums.

The manual drums consist of snare, high-hat, side tom, double tom and two symbols. The electric pad drum consists of six small pads.

These two drums have the same posture for the musicians,but the way of playing these instruments vary sometimes,that isthe electric pad drummers can play the instruments by sitting as well as standing also,but in manual drummers the musicians should have a sitting posture so that the rhythm comes fine. The manual drums also consists of double bass were both the limbs are used to play the instrument.

The frequently used body parts in playing these instruments are the upper and lower limb, wrist, elbow and fingers. Comparing these two drummers, manual drummers turn their whole body to play the instruments so the beats are clear and perfect, while the electric pad drummers don't rotate their body and they can adjust their instrument according to their comfort.

There are very few studies in India done on musicians' especially on drummers and also there are no specific studies focussing on the different types of drummers. In today's world, as music has evolved, the pressure on drummers has increased. A drummer must have increasingly more speed, control, power and endurance in order to be exceptional, but very few studies have been done to address the injuries faced by them. Thus the study aimed to find the prevalence of playing related musculoskeletal discomfort among manual and electric pad drummers.

Procedure: Thisstudy commenced after getting clearance from the Institutional Ethical Committee and was conducted in various music academies and schools. Thestudy design is Non Experimental Design, study type is observational type, sample size is 60, sampling method was convenient sampling and the study setting isMusic academy. The participants who fulfilled the inclusion criteria (Age: 15-35 years, Experience of 1 year and above, both men and women) and exclusion criteria (History of pain in both upper limb and lower limbs, History of recent fracture. Musculoskeletal pathologies, recent injury Peripheral nerve lesions) were included in the study, written consent form was obtained from the Professional drummers after explaining the procedure, the benefits of the study was said to the drummers.

A sample size of 60 subjects with age group of 15-35 years, both male and female was taken, in which 30 subjectswere manual drummers and 30 subjects were electric pad drummers and they were asked to complete the questionnaire .A format of MUSCULOSKELETAL PAIN INTENSITY AND PAIN INTERFERENCE QUESTIONNAIRE FOR MUSICIANS (MPIPIQM) depicting the prevalence of pain intensity and interference which consists of four parts that is musicians profile and hours of playing, there are four questions about pain and

rest five question about the interference. The data was recorded and tabulated.

Figure 1: Electric Pad Drum Standing Posture

Figure 2: Electric Pad Drum Sitting Posture

Figure 3: Manual drum posture

Outcome Measures:

Musculoskeletal Pain Intensity and Interfrence Questionnaire for Musicians: There was a substantial test-retest reliability for pain intensity items (range 0.78-0.82) and moderate to substantial test-related reliability for the pain interference items (range 0.56-0.76)

Data Analysis: The collected data were tabulated and analysed using IBM SPSS version 20 software. The statistical tool used in the study was the WILLCOXON SIGNED RANKS TEST. The WILLCOXON SIGNED RANKS TEST was used to analyse and compare both the groups.

Table 1: Pain intensity and pain interface among manual drummers using musculoskeletal pain intensity and interference questionnaire for musicians.

Variable	N	Mean	STD.Deviation	Wilcoxon Signed Ranks Test	SIG (2-Tailed)
Manual drummers pain intensity	31	5.4	6.460	-1.588	0.112
Manual drummers pain interference	31	5.45	6.612		

This table infers 30 samples which were taken in which the mean value of manual drummers pain intensity score is 5.24 and the mean value of manual drummers pain interference score is 6

Table 2: Pain intensity and pain interface among electric drummers using musculoskeletal pain intensity and interference questionnaire for musicians.

Variable	N	Mean	STD. Deviation	Wilcoxon Signed Ranks Test	SIG (2-Tailed)
Electric pad drummers pain intensity	31	1.87	5.365	-0.378	0.705
Electric pad drummers pain interference	31	1.97	5.282		

This table infers 30 samples which were taken in which the mean value of electric pad drummers pain intensity score is 1.87 and the mean value of electric pad drummers pain interference score is 1.97 .

Table 3: Comparison of pain intensity and pain interface between manual drummers and electric drummers using musculoskeletal pain intensity and interference questionnaire for musicians.

Variable	N	Mean	STD. Deviation	Wilcoxon Signed Ranks Test	SIG (2-Tailed)
Manual drummers & Electric pad drummers pain intensity interference	31	5.45	6.612	-2.716	0.007
Electric pad drummers pain intensity interference	31	1.97	5.282		

This table shows that the mean value of manual drummers pain intensity & interference score is 5.45 and the mean value of electric pad drummers pain intensity & interference score is 1.97 .

Discussion

Work related musculoskeletal disorders have been widely studied over the past several decades. Several factors such as sustained repetition, excessive force, static load and awkward position which paves the way for the development of the above said disorder.

Musculoskeletal disorders are also often associated with psychological stress due to work environment. As of knowledge various researches which were done on musculoskeletal problems mainly focus on industry and office work areas. To our knowledge there are only very few studies done among musicians and also studies that specifically describes the playing related musculoskeletal problems among various types of drummers were found lacking.

The musicians have to perform rapid, repetitive movements especially drummers for prolonged period of time. Drummers have musculoskeletal pain while playing or at rest because both the drummers have to adopt different postures during standing as well as sitting while playing the instruments. Hence this study is done to find out the prevalence of musculoskeletal problems among manual drummers and electric pad drummers. Drumming is characterized by involvement of several muscle groups because it has different types of genres which are required to play different types of beats e.g: a heavy rock song needs continuous use of double bass and varieties of rolls so the risk of musculoskeletal problems is high.

Normally, the musicians suffer pain in both the limbs, mainly it takes place in both drummers, mostly the musicians will have pain in shoulder, arm and wrist, and due to these problems they will have some restricted functional activities. The health effects of vibration exposure in drummers can result from extended periods of contact between a drummer and the vibrating surface they are exposed too.

Drummers particularly are at risk since they can be exposed to vibration through multiple body parts such as the hands-stick-drum head, feet-pedals-bass drum head and or hi hat or from the buttocks-seat-floor interfaces. Drummers can develop symptoms including back pain, diminished sensation and dexterity in the hands or feet, decreased grip strength, vascular injury resulting in finger blanching or “white fingers”, tendonitis or a variety of nerve entrapment neuropathies such as carpal

tunnel syndrome. Vibration levels depend on numerous properties including size and weight of the drumstick, types of drums, hand grip and handle location on the stick. While playing instruments, almost every musician have pain and discomfort but usually they have a tendency of ignoring their daily complaints which results in the development of overuse injuries.

This goes in hand with **Steinmetz et. al.** (2010) who stated that insufficiencies of the postural stabilization systems play an important role in the manifestation of musculoskeletal pain and playing-related musculoskeletal disorder in musicians.

Krupagohil et al, (2016) concluded that 80% of musicians were found to have playing related musculoskeletal disorders. Among manual drummers the professional players had musculoskeletal complaints than the practicing students. This study was done among drummers from various academy and music school. 60 professional drummers were taken which includes 30 manual and 30 electric drummers of both male and female and the participants were asked to fill the MUSCULOSKELETAL PAIN INTENSITY AND PAIN INTERFRENCE QESTIONNAIRE FOR MUSICIANS, which consists of four parts that is musicians profile and hours of playing, then four questions about pain and rest five question about the interference.

In manual drum the drummers obtain sitting posture while playing when compared to electric drummers who adopts both sitting and standing posture .While playing the manual drums, as we observe carefully the manual drummers have to rotate their whole body to play the instruments so that the beats come appropriate according to the rhythm and they also use both the lower limbs frequently. While playing, the electric pad drummer does not rotate their body when compared to manual drummers and they can adjust the height of the instrument according to their comfortable levels.

Blanca Del Carmen florers-olivares et al, (2015) stated that the manual drummers adjust the height of some elements of drums such symbols and snare this is done according to the dimension Most of these drummers have upper and lower back pain and also complaints of pain in shoulder, elbow, lower limbs and numbness in metacarpals.

In this study musculoskeletal pain intensity and interference is more in manual drummers as reported by them that they spend more playing sessions in sitting as well as frequent rotation of their body, and they cannot change their posture easily during the manoeuvre but electric pad drummers usually can change their posture according to their comfort. As judged by the above findings of the study both manual drummers and electric pad drummers have reported their pain intensity and interference.

Hence, this study concluded that the musculoskeletal discomfort is more pronounced in manual drummers when compared to electric pad drummers.

Conclusion

This study concludes that the musculoskeletal pain intensity and interference problems among manual drummers were more when compared to electric pad drummers. Most of the musicians were aware about the importance of warm-up and cool down exercises but only very few were found to follow it regularly.

Also, drummers need to be made more aware regarding Physiotherapy and its role in injury prevention as well as post injury rehabilitation. Simply taking a break from an activity that has caused physical problems does not help to find out the underlying cause of the problem. Physiotherapy camps and seminars could be implemented at various music schools and Institutes to help them understand the importance of Physiotherapy in injury prevention. Thus care should be taken and all the musicians should be made aware of these problems and should learn to recognise such injuries at the earliest to prevent further problems.

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Effectiveness of Low Level Laser Therapy Versus Ultrasound Therapy with Plantar Fascia Streching in Subjects with Plantar Fasciitis

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Abstract

Aim: To find the effectiveness of low level laser therapy versus ultrasound therapy with plantar fascia stretching in subjects with plantar fasciitis.

Materials and Method: Non equivalent quasi experimental study design was used in this study. Total of 30 subjects with plantar fasciitis were selected using non probability convenience sampling technique. 30 Subjects was divided into two groups by lot system. Group A received low level laser therapy and Group B received ultrasound therapy and for both the group plantar fascia stretching was given. The outcome measures are FAAM (foot ankle ability measure) and NPRS (numerical pain rating scale). Data collected and tabulated was statistically analysed.

Result: Statistical analysis of post-test, foot and ankle ability measure questionnaire (FAAM) and NPRS (numerical pain rating scale) revealed that there is statistically significant difference seen between Group A and Group B.

Conclusion: From the result, it has been concluded that low level laser therapy with plantar fascia stretching (Group A) is more effective than ultrasound therapy with plantar fascia stretching (Group B) in decreasing pain and improving the quality of life in subjects with plantar fasciitis.

Keywords: *Plantar fasciitis, low level laser therapy, ultrasound therapy.*

Introduction

The human foot is a strong and complex mechanical structure and terminal portion of the limb which bears weight and allows locomotion.[1] The plantar fascia is a dense, fibrous, connective tissue structure originating from the medial tuberosity of the calcaneus. It has three-medial, lateral and central portions.[2]

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Plantar fasciitis is a degenerative condition resulting from compressive forces due to repeated trauma to plantar fascia making the foot's longitudinal arch of flat. Traction forces during the gait on support phase leading to inflammation results in fibrosis and degeneration. Plantar fasciitis is the common reason for heel pain for 80 percentage of cases. It affects most commonly people who are between 40–60 years of age.[3]

The exact etiology of plantar fasciitis still remains unclear but the risk factors which results in plantar fasciitis includes overuse of plantar fascia, exercises like ballet jumping activities, long distance running, long period of standing, obesity, pregnancy, military recruits, athletes. The patient usually complaints of pain over the medial side of plantar heel, usually when taking first few steps after waking up.[4]

The common site of pain in plantar fasciitis is near to the origin of the central band of plantar Apo neurosis at the medial plantar tubercle of the calcaneus.[5]

The windlass mechanism explains these biomechanical stresses and factors. Plantar fasciitis forms the tie-rod that attaches from calcaneus to phalanges. Vertical forces from the weight of the body travel to medial longitudinal arch in downward direction through tibia and flattens the arch. Further, the ground reaction forces that travel in upward direction on the calcaneus and metatarsal heads, even more leads to flatten of arch as these forces fall anterior and posterior to the tibia. Plantar fascia prevent the collapse of arch by its tensile force and orientation.[6]

Plantar fasciitis tends to improve in most cases regardless of the treatment selected. As a result conservative management is effective for nearly 90% of the patient. The conservative treatments used in management of plantar fasciitis vary widely and are dependent on physician specialty.[

Methodology

The subjects were selected from the Saveetha physiotherapy, outpatient department of Saveetha medical college and hospital. 30 subjects with plantar fasciitis were selected based on the inclusion and exclusion criteria. Detailed procedure was explained to the subjects in the colloquial terms about the safety and simplicity of the procedure. Informed concern were given to those who were interested to participate in this study. Selected subjects were randomly assigned in to two groups 15 in each group by using lottery system. The outcome measure used in this study for pain is numerical pain rating scale(NPRS) and for the quality of life is foot and ankle ability measure questionnaire (FAAM) respectively. For all subjects' pre and posttest values were calculated.

Procedure: Group A Were the subjects who received low level laser therapy along with plantar fascia stretch. Group B were the subjects who received ultrasound therapy along with plantar fascia stretch.

For group A Probe method (continuous) of low level laser therapy was used to treat the subjects. Safety precautions was taken to reduce the risk of exposure of laser light to the eyes. Low level laser therapy was given in painful area for 3 days/week for 2 weeks. The wave length used in the treatment is 830nm for 9 minutes. The irradiation area include 3 point over $3cm^2$.

For group B Ultrasound therapy was given to the subjects in the frequency of 3 MHZ in the pulsed mode (1;4) for 8 minutes with the intensity of $0.5W/cm^2$ for 2 weeks (3days/week).

For both the group plantar fascia stretching was given with the hold time for 20-30 seconds with the repetaion of 10 times in the alternative days.

Results

The collected data was tabulated and analyzed using descriptive & inferential statistics. To all parameters mean and standard deviation (SD) was used. Paired t-test was used to analyse significant changes between pre and posttest measurements. Unpaired t test was used to analyse significant difference between the groups. P value <0.05 was considered as statistically significant.

Table 1 represents the FAAM Scale score for group A and B. The group A pre-test mean value is 39.93% (SD 7.93%) and post-test mean value is 66.87% (SD 7.30%).The group B pre-test mean value is 48.20% (SD 13.09%) and post-test mean value is 56.27% (SD 11.81%) .This shows that FAAM Scale score values are gradually increasing in the group A than group B, which is statistically significant.

Table 2 represents the NPRS score for group A and B. The group A pre-test mean value is 7.47cm (SD 1.19cm) and post-test mean value is 3.93cm (SD 0.80cm).The group B pre-test mean value is 6.27cm (SD 0.80cm) and post-test mean value is 5.53cm (SD 0.83) .This shows that NPRS score values are gradually decreasing in the group A than group B, which is statistically significant.

Table 1: Comparison of pre and post test values of FAAM scale for group A and B

FAAM Scale		Mean	SD	t value	p value
Group A	PRE	39.93%	7.93%	38.8492	0.0001
	POST	66.87%	7.30%		
Group B	PRE	48.20%	13.09%	9.9896	0.0001
	POST	56.27%	11.83%		

Group 1: Comparison of pre and post test values of FAAM scale for group A and B

Table 2: Comparison of pre and post test values of NPRS scale for group A and B

NPRS Scale		Mean	SD	t value	p value
Group A	PRE	7.47cm	1.19cm	14.9480	0.0001
	POST	3.93cm	0.80cm		
Group B	PRE	6.27cm	0.80cm	4.7845	0.0003
	POST	5.53cm	0.83cm		

Discussion

Plantar fascia is commonly a repetitive micro trauma overloaded injury of the attachment of plantar fascia at the inferior aspect of calcaneus.

The clinical presentation of plantar fasciitis include gradual insidious onset of heel pain. Pain and stiffness are worse in the morning(during first few steps) or after prolonged walking and increased by climbing stairs or doing raising up activity thus impairing the activity of daily life.

Conservative treatment for plantar fasciitis include ultrasound therapy, cryotherapy, low level laser therapy, medication (steroids), stretching, foot wear modification, manual therapy, splint, tapping and strapping.

This study compares the effectiveness of low level laser therapy and ultrasound therapy with plantar fascia stretching in subjects with plantar fasciitis in terms of pain and quality of life.

The subjects with age group of 30-60 years of both gender with plantar fasciitis were selected. 15 subjects in Group A were treated with low level laser therapy with plantar fascia stretching while 15 subjects in Group B were treated with ultrasound therapy with plantar fascia stretching.

The pre-test and post-test values of this study, revealed that there was a statistical difference ($p<0.0005$) in both the groups in terms of pain and quality of life, but there was more improvement in Group A than Group B.

WOLGIN M, et al stated that low level laser effects causes the stimulation of bodies own processes in healing tissue by light [12]. Phototherapy increases the both local and systemic micro circulation of the body thus it relieves pain and swelling [22]. The 2 major areas for which low level laser therapy is used is tissue healing and pain control. Laser therapy is used for pain relief in many conditions in both acute and long term (England 1998). [23] The laser therapy is found to be very effective in various overuse tendinitis conditions. Laser has its effect on prostaglandin synthesis and thus it relieves inflammation. [24]. DR.ZANG said that 3 to 4 treatment are necessary for acute plantar fasciitis if treatment begins 6 to 8 weeks after the onset of symptoms.

Ultrasound has been utilized for pain through the ability of sound waves to introduce molecules of chemical substances through the skin by a process called phonophoresis [25]. Improvements in plantar fasciitis by the application of ultrasound therapy has been reported by Clarke and stenner (1976) [26]. The application of ultrasound therapy for pain relief, along with plantar fascia stretch is commonly indicated alternative therapy for plantar fasciitis [27]. The pulsed ultrasound is believed to have therapeutic benefits and can be applied to acute injuries [28]. The effects of ultrasound therapy are tissue relaxation, increase in local blood flow, scar tissue breakdown. By increasing the local blood flow level it reduces local swelling and inflammation. WATSON (2006) suggested that application of ultrasound to injured tissues, speed the rate of healing and enhance the quality of repair.

Plantar fascia stretching reduces the tightness in the plantar fascia. Plantar fascia stretching recreates the windlass mechanism by decreasing the micro trauma and inflammation. Plantar fascia stretching helps in reducing pain, improving function and gives overall satisfaction compared to standard Achilles tendon stretching exercises [13].

The post mean value in this study of quality of life [foot and ankle ability measure(FAAM)] and pain [numerical pain rating scale (NPRS)] score of Group A treated with low level laser therapy with plantar fascia stretching was 66.87 and 3.93 and Group B treated with ultrasound therapy with plantar fascia stretching was 56.27 and 5.33 at the end of 2 weeks.

Hence is has been proven that the recovery is earlier and faster in relieving pain and improving quality of life in Group A than Group B. Thus these statistical findings could be attributed to the fact that low level laser therapy with plantar fascia stretching works more statistically over ultrasound therapy with plantar fascia stretching

Conclusion

From the result, it has been concluded that low level laser therapy with plantar fascia stretching (Group A) is more effective than ultrasound therapy with plantar fascia stretching (Group B) in reducing pain and improving quality of life in subjects with plantar fasciitis.

Ethical Clearance: Taken from Institutional Sceintific Review Board

Conflict of Interest: Nil

Source of Funding: Self

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Evaluation of Temporomandibular Disk Position in Symptomatic Temporomandibular Disorder Patients with Gnathological Splint Therapy Using MRI

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Abstract

Objective: The aim of this study was to Evaluation of altered temporomandibular disc position in symptomatic TMD patients with pre and post gnathological splint therapy.

Materials and Method: This study included ten patients with a mean age of 21.5 years with maxillary transverse deficiency treated with the skeletal expander. The study consisted of 15 patients with a mean age of 25 years with clinically symptomatic and orthodontically untreated TMD patients with splint therapy. Statistical analysis was performed using paired t-test.

Results: The mean AS, SS, and PS values for right TMJ that was 0.2mm (SD ±0.6mm), 0.5mm(SD± 0.3mm), 0.4mm(SD±0.1mm), respectively and the mean difference between AS, SS, and PS values for left TMJ was 0.2mm (SD±0.1mm), 0.5mm (SD± 0.05mm), and 0.2mm (SD± 0.2mm). The ratio of AS to SS to PS was 0.2to 0.5to 0.4, No significant sex difference was noted in joint space distances. The results showed less variability of condylar position in the fossa than in normal subjects.

Conclusion: Gnathological splints can be used as effectiveness mean for treatment of such patients. This can be easy made good comfort to the patients.

Keywords: *TMJ, Splint, MRI, Joint space.*

Introduction

The temporomandibular joint (TMJ) is a compound articulation of the articular surfaces of the temporal bone and the mandibular condyle[1]. The TMJ functions uniquely in that the condyle both rotates within the fossa and translates anteriorly along the articular eminence. The condyle's ability to translate the mandible can have a much higher maximal Incisal opening than would be possible with rotation alone. The joint is thus referred to as "Ginglymodiarthrodial."[2] a combination of the terms Ginglymoid (rotation) and Arthroidal (translation). TMD is a prevalent disorder most commonly observed in individuals between the ages of 20 years to 40 years. Approximately 33% of the population has at least one TMD symptom and 3.6-7% of the population has TMD with sufficient severity to cause them to seek treatment[3]. The etiology of TMJ disorders remains unclear, but it is likely multifactorial. Capsule inflammation or damage and muscle pain or spasm may be caused by abnormal occlusion, parafunctional habits (e.g., bruxism, teeth clenching, lip biting), stress, anxiety, or abnormalities of the intra-articular disk. Treatment of TMJ disorders are varied. But dental occlusal splinting and permanent occlusal adjustment have been the mainstays of TMJ disorder treatment. Occlusal splint therapy may be defined

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as "the art and science of establishing neuromuscular harmony in the masticatory system by creating a mechanical disadvantage for parafunctional forces with removable appliances."Conventional tomographic x rays are commonly used to view the temporomandibular joint area. However because of poor quality of images and variability in interpretation of anatomic areas, it failed to provide necessary information for diagnosing optimal condylar position. Magnetic resonance imaging (MRI) is a non invasive, non ionizing procedure that produces highly sensitive and specific tomographic images in any plane with excellent soft tissue contrast and reduced biologic hazards. Magnetic resonance imaging (MRI) has become the gold standard for examination of soft tissues of the TMJ.The purpose of the study was to evaluation of joint spaces before and after splint therapy by MRI[5,6].

Materials and Method

The sample for the study was recruited from the patients who reported to the Department of Orthodontics at sreebalaji dental Dental College and Hospital. Ethical approval was obtained from the Institutional Review Board and informed written consent was obtained from all the participants. The sample consists of fifteen patients within the age group of 22–30.

Inclusion Criteria: Clicking sound in TMJ area,Tenderness of muscles of mastication, Deviation of the lower jaw on opening, Unilateral or bilateral headaches, shoulder pain and/or neck pain, Generalised attrition/mobility of teeth. **Exclusion Criteria:** Developmental anomalies, Degenerative disc conditions, Orthodontically treated patients**.**

Splint Fabrication: The study was initiated with Maxillary and mandibular impression which were taken using an irreversible hydrocolloid in sterilized metal rim-lock trays and poured with Type 4 Gypsum, facebow transfer, Roth's power centric bite registration, centric occlusion bite registration, articulation, CO-CR discrepancy. After assessing the CO-CR discrepancy splint was fabricated and delivered[12]. Face-bow transfer records were taken using the Axioquick Expansion Kit AX, (SAM Prazisionstechnik GmbH, Fussbergstr 1, Germany). It records the relationship of the maxilla to the cranial base [Figure 1].

a

b

Figure 1: Face bow transfer (a) frontal view (b) profile view

The wax bite recorded in patient's initial CR, which should not be mistaken for terminal CR. It is difficult to capture one's true CR at chair-side during initial visit a true CR can be registered only after the stabilization of condylar position. Centric relation bite (Roth power centric) [Figure 2] was taken with Delar bite registration wax in two sections, one in the anterior region and the other in the posterior region. The patient was seated in the dental chair reclined at an angle of 45° to the floor. To take the anterior section, the wax (2–3 layer thickness) was cut in a shape and appropriate size to register from canine to canine. The wax was then heated until soft in a water bath at 138°F. The wax bite was then placed in the patient's mouth extending from canine to canine. The patient's mandible was then manipulated (to CR) to make an interocclusal registration in the anterior section. The patient was then instructed to close until the posterior teeth were discluded approximately 3 mm in the area of the second molars. While in the closed position, an air syringe was used to begin the cooling process. The anterior record was then removed, and stored in chilled water. The posterior section was trimmed wide enough to include the last molar extended across the arch. The

wax was then softened and placed on the maxillary posterior teeth. With the posterior section in place, the chilled anterior portion was placed back in position again. The patient was then guided in the same manner to close into the hardened anterior segment and asked to bite as firmly as possible and hold it. This allowed the patient's musculature to aid in seating the condyle in CR position. Both the bites were then removed and stored in chilled water.

Figure 2: Roth power centric bite

With the help of face-bow transfer record, the maxillary model is mounted to the articulator with the mounting plate and mounting plaster [Figure 3]. Sufficient time is allowed for the plaster to set. The incisal guide pin is raised by 3 mm. To mount the lower model, the articulator is inverted, the centric wax bites are placed on the maxillary model, and the mandibular model is placed into the wax. A mounting plate is fastened to the lower member of the articulator, and the mandibular model is mounted, using mounting plaster or dental stone.

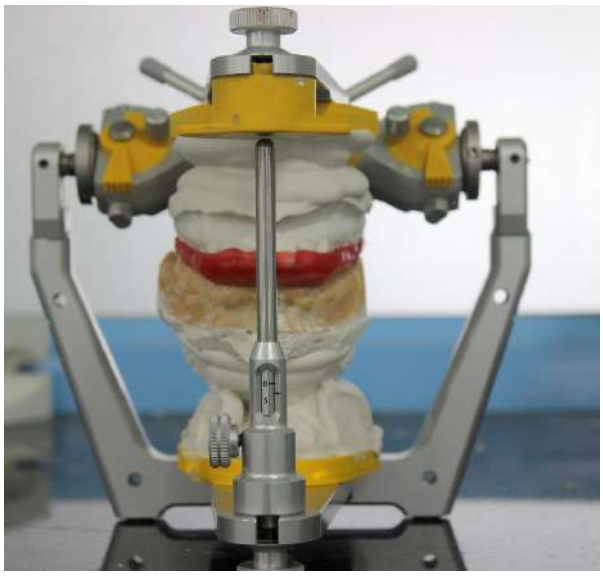

Figure 3: Mounted models

The splint was fabricated on an articulator. Upon closure of the arches, there were simultaneous centric stops with mandibular buccal cusp. Clearance of 0.0005"[8] was provided for the anterior teeth. Splint was fabricated with cold cure acrylic resin at a position with 3 mm clearance from the fulcrum. The splint was then allowed to set for sufficient time. With the splint still not removed from the articulator, initial trimming was done to establish centric stops and mutually protected functional occlusal pattern. The splint later was adjusted in the patient's mouth to do further trimming to establish the same [Figure 4]. The patient was advised to wear the splint full time[9].

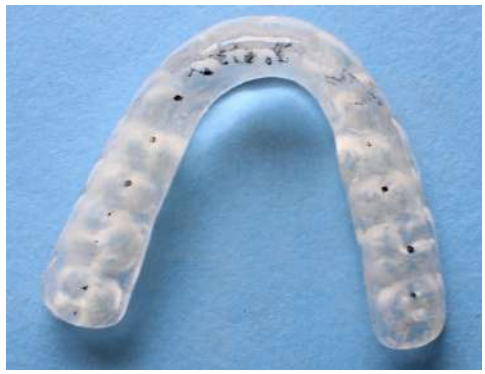

Figure 4: Splint with centric stops

Patient was recalled every month, and the splint was checked for centric stops and mutually protected occlusal pattern each time. The mandible was checked and guided to centric, and it was noted that each time, the mandible exhibited lesser resistance indicating the reduction in muscle stiffness due to deprogramming..

Measurements: The condylar joint spaces before and after 6 months of gnathological splint therapy was assessed by MRI

MRI:

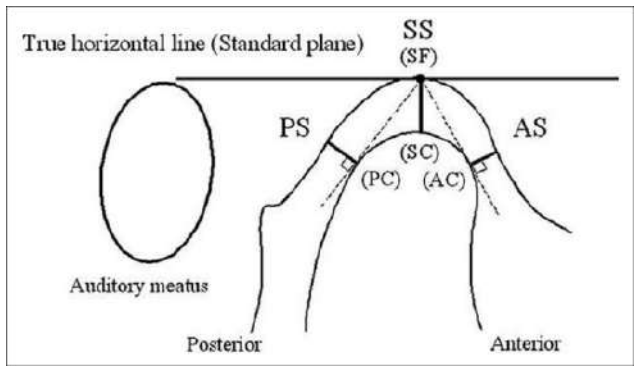

Figure 5: Shows an measurement in MRI IMAGE of the TMJ

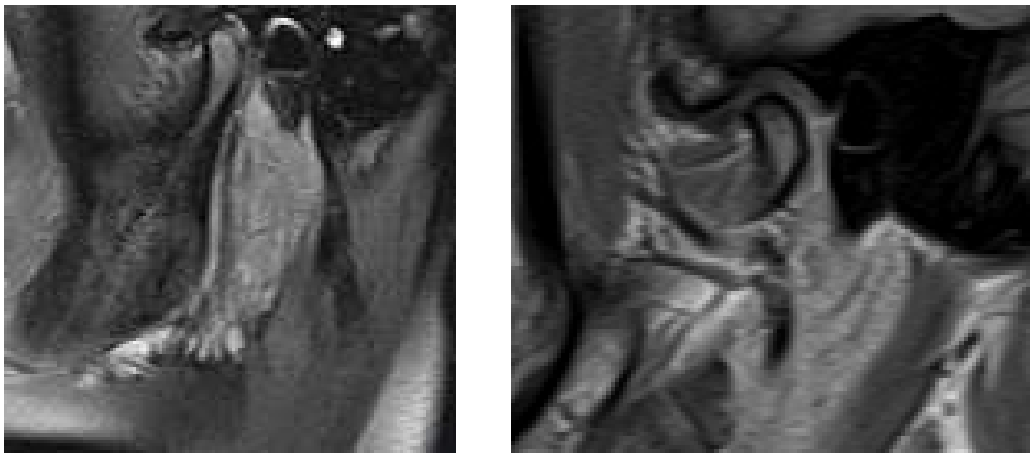

Figure 6: Pre -treatment left and Right

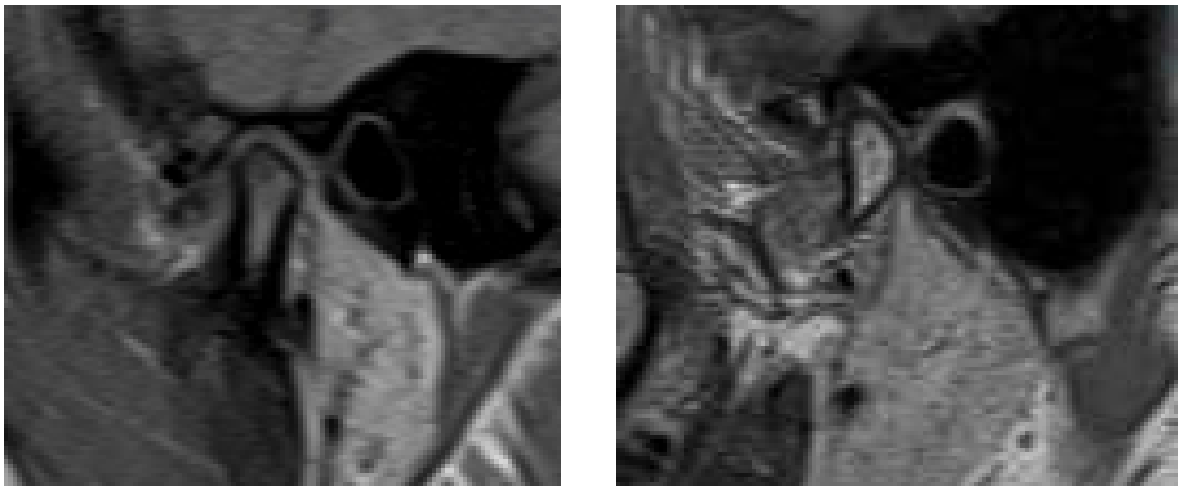

Figure 7: Post treatment left and Right

Table No.: 1: Right joint space values

Right Joint						
Patient No.	**Pre–Anterior Space**	**Post–Anterior Space**	**Pre- Superior Space**	**Post- Superior Space**	**Pre-Posterior Space**	**Post-Posterior Space**
1	1.23	1.27	2.56	2.4	2.49	2.39
2	3.24	2.8	5.38	3.5	3.75	2.1
3	1.79	1.01	2.36	2.18	2.48	2.1
4	3.01	2.8	4.97	4.4	2.8	2.69
5	1.23	1.17	2.56	2.39	2.48	2.4
6	1.78	1.66	3.31	3.13	2.68	2.14
7	1.5	1.21	2.01	2.01	2.83	1.98
8	2.01	1.61	3.37	2.2	3.89	2.85
9	1.63	1.81	3.45	3.03	2.26	1.18
10	2.89	2.5	4.97	4.41	2.8	3.83
11	3.39	2.96	4.48	2.84	2.45	2.11
12	1.23	1.17	2.56	2.4	2.49	2.41
13	1.79	1.1	2.4	2.18	2.48	2.38
14	1.96	1.63	2.71	2.2	3.81	2.65
15	1.47	1.29	3.32	2.8	2.49	2.25

Table 2: Left joint space values

Left Joint						
Patient No.	**Pre–Anterior Space**	**Post–Anterior Space**	**Pre- Superior Space**	**Post- Superior Space**	**Pre-Posterior Space**	**Post-Posterior Space**
1	1.64	1.31	3.24	2.84	2.26	2.74
2	3.5	3.49	3.6	2.89	2.15	1.76
3	1.64	1.4	3.24	2.84	2.26	2.74
4	5.5	3.98	6.02	5.27	3.75	2.95
5	1.62	1.39	3.25	2.81	2.24	2.73
6	3.4	3.29	3.5	2.39	2.15	1.76
7	1.94	1.7	4.6	3.92	3.43	3.21
8	2.78	2.1	4.12	3.82	2.9	2.82
9	2.03	1.87	3.25	2.87	3.92	2.87
10	2.78	2.58	3.25	3.1	2.89	2.79
11	4.05	3.92	6.02	5.27	3.75	2.95
12	1.54	1.58	2.03	2.01	2.58	1.9
13	1.68	1.52	2.2	1.58	2.48	2.23
14	1.96	1.7	4.6	3.92	3.43	3.2
15	1.75	1.5	2.27	1.3	2.6	2.23

Table 3: Right joint space mean values

Pre vs Post Treatment (Right)	**Mean Difference**	**Significant P value**
Pre treatment (AS)	0.2773	0.002
Post treatment (AS)		
Pre treatment (SS)	0.556	0.001
Post treatment (SS)		
Pre treatment (PS)	0.448	0.005
Post treatment (PS)		

Table 4: Left joint space mean values

Pre vs Post Treatment (Left)	**Mean Difference**	**Significant P value**
Pre treatment (A)	0.2987	0.001
Post treatment (AS)		
Pre treatment (SS)	0.5573	0.001
Post treatment (SS)		
Pre treatment (PS)	0.2607	0.004
Post treatment (PS)		

If P-Value is <0.05 then statistically significant

Statistical Analysis: The Normality tests Kolmogorov-Smirnov and Shapiro-Wilks tests results reveal that the variables (Vertical and Horizontal distances) follow Normal distribution. Therefore to analyse the data parametric method are applied. To compare the mean PAIRED SAMPLE t-test were used for each measurement to evaluate the average differences between the right and left side of the each sample. To analyse the data SPSS (IBM SPSS Statistics for Windows, Version 22.0, Armonk, NY: IBM Corp. Released 2013) is used. Significance level is fixed as 5% (p= 0.05).

Result

- Table 1 and 2 shows the pre and post treatment outcomes of mean value of 15 patients in terms of change in the Anterior. Superior, Posterior joint space (AS, SS and PS) (Measured in mm) in the right and left side joint respectively.
- Table 3 and 4 shows the mean difference between AS, SS, and PS values of pre and post-treatment for right TMJ that was 0.2mm (SD ±0.6mm; p-value 0.002), 0.5mm(SD± 0.3mm; p-value 0.001), 0.4mm(SD±0.1mm; p- value 0.005), respectively and the mean difference between AS, SS, and PS values of pre and post-treatment for left TMJ was 0.2mm (SD±0.1mm; p- value 0.001), 0.5mm (SD± 0.05mm; p- value 0.001), and 0.2mm (SD± 0.2mm; p- value 0.004), respectively.
- The result of this study hence showed that there was statistical significant difference in the all anterior,

superior, and posterior space both in the right and left side joint pre and post treatment and the values of post treatment approached the mean values reported by Kazumi et al.

Discussion

Some TMD patients awake with TMD pain that only last m minutes to hours, suggesting that nocturnal factors are the primary contributors to these symptoms. In this third patient group, patients generally report that either their awaking or daytime symptoms are worse, suggesting that the nocturnal or diurnal factors are more significantly contributing to their symptoms[10]. Therefore it's best that the splint is worn 24 hours a day for best effective treatment and so full time wear of gnathological splint was advocated in this study. Roth power centric bite registrations anatomically seat the condyles in anterior superior position within the fossa.[14]

It has been reported that clinical examination for the diagnosis of anterior disc displacement with reduction has an accuracy of 43–75%.This suggests that a clinical examination should be done together with other imaging method in order to determine the relationship between the articular disc and condyle. In recent years, magnetic resonance imaging (MRI) has been used because it is an effective, noninvasive method that does not appear to cause any biological hazard.

The goal of our study was to check the condylar disc position, joint space in pre and post gnathological splint therapy for six months using MRI in patient with TMD problems .Subject were patients who had an anterior disc displacement with reduction before treatment. Our study was designed to identify the condylar disc position, joint space[13].

Kazumi et al (2009) in his study on optimal condylar position in the fossa on sagittal CBCT images in functionally optimal joints without displacement reported that mean AS, SS, & PS values are 1.3mm (SD±0.2mm), 2.5mm (SD±0.5mm) and 2.1mm (SD±0.3mm), respectively. The ratio of AS to SS to PS was 1.0 to 1.9 to 1.6.In our present short term study the patients are symptomatic of TMD and post treatment results were taken after six months. In my study using MRI, the post treatment values approximate the results provided by Kazumi et al.

All the symptomatic patients who were selected in this study exhibited resolution of symptoms such as pain located around the TMJ, pain that was referred to the neck, head and ear and pain that was located immediately in front of the tragus of the ear, projecting to the ear, cheek, and along the mandible. The restricted jaw motion was also resolved in all of the study patients but joint noise such as clicks and crepitus resolved only for a little more than 60% of the patients in the span of just four weeks of total six months.

Conclusion and Summary

TMD should be treated like any other musculoskeletal complaints. If TMD is left untreated, symptoms can be worsen and extend far beyond the jaw and the mouth area. Gnathological splints can be used as effectiveness mean for treatment of such patients. This can be easy made good comfort to the patients.

Amount of change in the right side TMJ

- AS – 0.2773
- SS – 0.556
- PS – 0.448

Amount of change in the left side of TMJ

- AS – 0.2987
- SS – 0.5573
- PS – 0.2607
- Relief of pain and other symptoms
- MRI supported our clinical results with great specificity.

Conflict of Interest: No relavent conflict of interest among authors.

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Antimicrobial Efficacy of Triphala as Root Canal Irrigating Solution in Infected Primary Teeth: An Ex Vivo Study

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Abstract

Background and Objectives: Dental caries is a common problem encountered in children. Deciduous teeth with deep dental caries can be treated with pulp therapies to allow normal exfoliation process. The process of pulpectomy involves access cavity preparation, cleaning and shaping of the root canal and obturation. Even though all these procedures are essential, irrigation of the root canal during cleaning and shaping is vital in ensuring complete microbial decontamination, which guarantees the success of pulpectomy. Although NaOCl is considered as gold standard among root canal irrigants, the quest for a better irrigant with superior antimicrobial efficacy and biocompatibility was under consideration.

Hence, the present ex vivo study was done to evaluate and compare the antimicrobial efficacy of 0.5% Sodium hypochlorite (Dakin's solution) with 10% Triphala, a herbal root canal irrigant.

Results: The study showed a statistically significant difference in the anti-microbial efficacy of 10% Triphala and 0.5% Sodium hypochlorite (Dakin's solution).

Conclusion: The antimicrobial efficacy of 10% Triphala was better than that of 0.5% Sodium hypochlorite (Dakin's solution) when used as root canal irrigants in infected primary teeth.

Keywords: *Triphala, Sodium hypochlorite, Root canal irrigant, Antimicrobial efficacy.*

Introduction

The dental root canal is not a single microbial environment but is one of the most heavily bacterially contaminated sites in the body. Some of the microbial species reported in the root canal system are *Streptococcus*, *Staphylococcus, Lactobacilli, Enterococcus, Klebsiella, Pseudomonas, Actinomyces* etc. A clinician ensures a patent and clean root canal system by eliminating these microbial floras via endodontic treatment.[1]

Though all the steps of endodontic therapy are vital and should be carried in a systematic manner, irrigation forms the backbone of pulp therapy. Copious irrigation helps in the debridement of the root canal, destruction of microbes, removal of tissue remnants and dentin debris during instrumentation.[2]

Many irrigating solutions such as halogenated compounds (sodium hypochlorite), chlorhexidine, chelating agents (EDTA, citric acid), MTAD, hydrogen peroxide, maleic acid and chlorine dioxide have been used to disinfect the root canal. Among these enumerable

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irrigants sodium hypochlorite is considered as the gold standard for endodontic irrigation.[2,3]

Despite being the gold standard, sodium hypochlorite has an unpleasant taste andwhen it comes in contact with the tissue, causes hemolysis and ulceration. It also inhibits neutrophil migration and damages vascular, endothelial and fibroblast cells. Handling this solution also requires utmost care since it can also causes damage to the permanent tooth follicles and periapical tissues if gone beyond the working length and resorbing apex.[2,4]

Due to the constant increase in antibiotic resistant strains and also due to the side effects caused by sodium hypochlorite and other synthetic drugs herbal alternatives are more preferred as root canal irrigant. Various herbal alternatives for endodontic applications are Triphala, *Morindacitrifolia* (Indian mulberry), *Curcuma longa* (Turmeric), Green tea polyphenols, Liquorice, Propolis, *Melaleucaalternifolia* (Tea tree oil) and *Azadirachtaindica* (Neem).[5,6]

Triphala is a herbal formulation consisting of fruits of *Terminaliabelerica* (Bibhitaki), *Terminaliachebula* (Haritaki), and *Emblicaofficinalis* (Amalaki) in 1:1:1 ratio. Triphala showed strong antimicrobial activity against different microorganisms. The beneficial effects of Triphala are that, it can be used as a root canal irrigant, it has anti-caries effect, anti-periodontal disease effect, anti-collagenase effect, anti-microbial effect, anti-fungal effect, analgesics and anti-pyretic effect, anti-oxidant effect and anti-cancer effect.[5,7]

Hence the present study compared the antimicrobial efficacy of 10% Triphala as a root canal irrigant, with 0.5% sodium hypochlorite (Dakin's solution).

Materials and Method

30 patients who reported to the Department of Pedodontics and Preventive Dentistry with deep dental caries involving pulp were selected for the study. After access cavity preparation a barbed broach was inserted into the canal and along with the infected pulp it was transferred to sterile container having 2ml normal saline (Figure 1). The saline container was then taken for microbiological procedures.

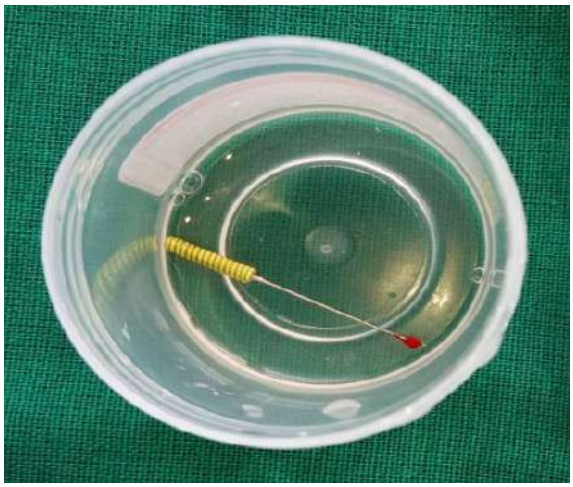

Fig. 1: Collected Sample Stored in a Saline Container

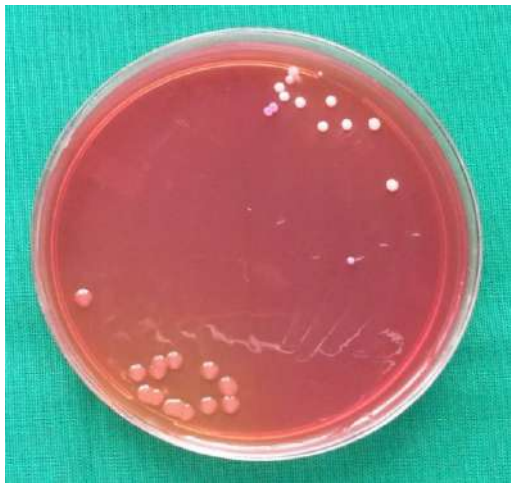

Fig. 2: Microbial growth on MacConkey Agar

The sample was subcultured onto Blood agar and MacConkey agar (Figure 2 and 3). Mac Conkey agar was incubated at 37ºC for 24hours and Blood agar plates was kept in 5-10% CO_2 in a candle jar and incubated at 37ºC for 24hours. After incubation period, the colonies were identified by its colony morphology, gram staining, coagulase and catalase test.

From the incubated plates bacterial colonies were taken and bacterial suspension was made in 1ml of normal saline. A sterile swab was dipped in bacterial suspension and transferred to Muller Hinton agar based Blood agar for *Streptococci* and *Enterococci* species and lawn culture was made using cotton swab. For *Staphylococci* species Muller Hinton agar was used and lawn culture was made.

6mm wells were dug in the plates and in each well 300µl of 10% Triphala, 0.5% Sodium hypochlorite (Dakin's solution) and Normal saline were poured using micropipette. This plate was kept in 5-10% carbon dioxide in a candle jar and incubated at 37ºC for 24 hours. After incubation period, diameter of zone of inhibition was measured for 10% Triphala, 0.5% Sodium hypochlorite (Dakin's solution) and Normal saline, which acted as a negative control and the values were compared with each other to determine the anti-microbial efficacy of root canal irrigants (Figure 4).

All the clinical procedures were carried out following the protocols approved by the Ethics and Review Committee of Sri Siddhartha Dental College and Hospital, Tumkur (IEC 12/2016).

Fig. 3: Microbial growth on Blood Agar

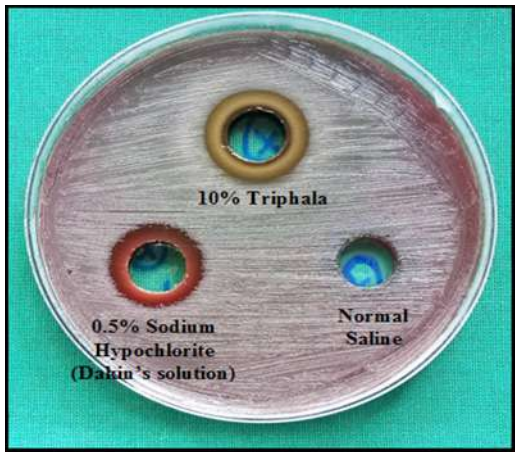

Fig. 4: Agar Plate Showing Zones of Inhibition

Findings: Table 1 shows the mean and standard deviations of zone of inhibition produced by 10% Triphala and 0.5% Sodium hypochlorite (Dakin's solution). It has been calculated from the zone of inhibition values collected from 30 samples. The mean zone of inhibition produced by 10% Triphala was 23.83 mm and that by 0.5% Sodium hypochlorite (Dakin's solution) was 20.97 mm with a p-value of 0.0047. This shows that 10% Triphala has a statistically significant antimicrobial efficacy than 0.5% Sodium hypochlorite (Dakin's solution).

Table 1: Mean Zone of Inhibition produced by 10% Triphala and 0.5% Sodium Hypochlorite (Dakin's Solution)

Irrigant	Minimum (mm)	Maximum (mm)	Mean (mm)	Standard Deviation	P Value	Significant
10% Triphala	16.00	32	23.83	3.141	0.0047**	Significant
0.5% Sodium hypochlorite	14	30	20.97	4.319		

*p value ≤ 0.05, ** p value ≤ 0.01, *** p value ≤ 0.001

The present study was done to assess the anti-microbial effectiveness of 10% Triphala and 0.5% Sodium hypochlorite (Dakin's solution) as intracanal irrigants in infected primary teeth. The anti-microbial properties of the test solutions were evaluated by measuring its mean zones of inhibition.

In the present study the mean zone of inhibition for 10% Triphala was 23.83mm and 20.97mm for 0.5% Sodium hypochlorite (Dakin's solution). The result of this study was in close accordance to the study done byShukla et al.[8] who compared the antimicrobial efficacy of Triphala and 5% Sodium hypochlorite and found mean zone of inhibition for Triphala as 32mm and 22mm for 5% Sodium hypochlorite against *Staphylococcus aureus*. In the same study Triphala showed mean zone of inhibition of 27mm and 5% Sodium hypochlorite showed 24mm against *Enterococcus faecalis*.Shakouie

et al.[9] in a study found the mean zone of inhibition for Triphala as 7.3 +/- 1.3mm and 4.6 +/- 1.6mm for 0.5% Sodium hypochlorite.On comparing the mean zone of inhibition of Triphala and 5.25% Sodium hypochlorite, Karwa et al.[10] found 18mm for Triphala and 24.6mm for 5.25% Sodium hypochlorite against *Enterococcus faecalis*.

The increased zone of inhibition of Triphala can be attributed to its antimicrobial effect. Antimicrobial activity of Triphala is accredited for its formulation which contains three different medicinal plants in equal proportions namely, *Terminalia bellerica, Terminalia chebula* and *Emblica officinalis.* All these components have an additive orpositive synergistic effect. *Emblica officinalis* assists in lipid peroxidation and plasmid DNA assay, while *Terminalia chebula* has noticeable radical scavenging activity. The anti-bacterial property of Triphala includes either inhibition of cell division or damage to the cell walls of the bacterium.[11,12]

The differences in the mean zone of inhibition among the present and other studies can be attributed to the concentration and volume of the solutions used and the microorganisms on which the solutions were tested.

Conclusion

The study concludes that 10% Triphala has a statistically significant antimicrobial action compared to that of 0.5% Sodium hypochlorite (Dakin's solution). However, further in vivo research is needed to conclusively recommend Triphala as a root canal irrigant.

Conflict of Interest: There is no conflict of interest in the research.

Funding: This study has not been funded by any organization.

Ethical Clearance: All the clinical procedures were carried out following the protocols approved by the Ethics and Review Committee of Sri Siddhartha Dental College and Hospital, Tumkur (IEC 12/2016).

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Association between Urinary Cotinine Levels and Buccal Mucosal Micronuclei Cells of Smokeless Tobacco Chewers Attending a Tertiary Care District Hospital

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Abstract

Introduction: Oral squamous cell carcinoma encompasses at least 90% of all oral malignancies. It is sixth most common malignancy and the major cause of cancer morbidity and mortality worldwide. Early detection of a premalignant oral lesion would improve the survival to a greater extent. Tobacco lays an enormous effect of disease for health, economic, social and environment issues. Cross sectional study was done at tertiary care hospital to find association between urinary cotinine levels and buccal mucosal micronuclei cells of smokeless tobacco chewers.

Method: Study comprised of 300 Smokeless Tobacco chewers (STC) and 300 Non tobacco chewers (NTC). Physical examination and Anthropometric parameters were recorded. Fasting urine samples collected for extraction of cotinine. Buccal smears were prepared for exfoliated cells. Slides were stained by Papanicolaou stain and micronuclei (MN) cells was examined by using 100X, 400X magnification as per the Tolbert et al criteria.

Results: Mean Urinary Cotinine in STC was enhanced as compared to NTC. The MN cells were also increased in STC as compared to NTC & statistically highly significant (Mean SD of STC 21.30±10.55, 95% CI; 20.11 to 22.49, NTC Mean SD 3.74±3.43, 95% CI; 3.35 to 4.12). The MN cells of STC showed strong positive association & statistically highly significant correlation with urinary cotinine levels (r= 0.692, p=<0.0001).

Conclusions: The present study establishes link between rise in exfoliated buccal MN and determination of urinary cotinine levels which is a biomarker of genotoxicity and epithelial carcinogenic progression.

Keywords: *Smokeless tobacco chewers, Non tobacco chewers, Micronuclei, Cotinine.*

Introduction

Oral cancer is one of the commonest causes of disease and death rate nowadays. In developing countries, both smokeless tobacco chewing and smoking have cancerous causing behavior that contributes to increasing global burden of oral cancer. The World Health Organization figured out that proportion of deaths that result due to tobacco-related diseases would rise in India from 1.4% of all in 1990 to 13.3% of all deaths in 2020[1,2].

Tobacco lays an enormous effect of disease for contrary health, economic, social and environment issues. The tobacco epidemic is among the largest public health threat at present situation which almost

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kills six million peoples per year. Among mortality of ten adults in every six seconds, one death is reported due to habitual tobacco. Use of tobacco is an indicatory public health problem on earth and the only cause for preventable hazard for human health[3].

As per latest report intimated by Global Adult Tobacco Survey 2, (GATS-2) 2016-17 in India affirm that 28.6% of adults aged >15 (26.7 crore) use tobacco in various forms. Smokeless tobacco usage is marked in every 5th adult (19.9 crore) and (10.0 crore) in every 10th adult in smokers[4].The frequency of tobacco usage is around 37.97% in men 12.5% in female in Belgaum region and the commonest form of tobacco use is smokeless tobacco (ST)[5].

Biological consequences of Nicotine are widespread and lengthened to all systems of the body including cardiovascular, respiratory, renal and reproductive systems[6]. Smokeless tobacco is thought to be highly addictive due to their high nicotine content. The ST also contain carcinogenic substances like tobacco-specific N-nitrosamines (TSNAs) leading to an increased risk of cancers of oral cavity, pharynx and esophagus. Depending on the type of ST products, nicotine content may vary, and therefore, measurement of nicotine and its metabolites among ST users is important to understand the addictive potential of ST products. The half life of nicotine is very less and its metabolites especially cotinine has a long half life, which is good biomarker of nicotine in urine (urinary cotinine level)[7,8].

Estimation of cotinine concentration levels from urine sample of Smokeless tobacco chewers (STC) and Non tobacco chewers (NTC) by High performance liquid chromatography- Diode array (HPLC-DA) and conformation of cotinine metabolite by Gas Chromatography-Mass spectrometry (GC-MS) serves as useful marker to determine the effects of different forms of tobacco consumption.Studies on nicotine and Cotinine levels in smokers and passive smoking in other ethnic groups are well documented but very few studies are found in STC. This may be fact because of the cultivation of the tobacco crops in specific parts of that region only[9].

Multiple studies have reported that all forms of tobacco use are highly prevalent in both men and women in India. The prevalence of ST use is estimated 33%and 18% for men and women respectively in India[10]. The risk of oral cancer associated with those who use chewing tobacco is approximately 50 times higher than that of non-tobacco users. Nearly 90% of oral neoplasms are caused by smokeless chewing tobacco. Chewing tobacco also results in lesions like leukoplakia caused due to chronic irritation. Many tumorsare likely to be known to arise from these lesions.

Globally, about 5, 00,000 new oral and pharyngeal cancers are diagnosed annually and three-quarters of these are seen in the developing countries, including about 65, 000 cases being reported from India[11]. The micronuclei (MN) assay in exfoliated buccal epithelial cells is potentially an excellent candidate to serve as a biomarker. If not precise, but an arbitrary prediction about the molecular changes that take place in the buccal mucosal cells of tobacco users in individuals without any lesion can hint towards the occurrence of any lesion in those individuals in future[12]. The biomarkers most widely used to quantify exposure to tobacco include nicotine, and their metabolites are cotinine, carbon monoxide, and thiocyanate. Recent investigation has focused on various hemoglobin and DNA (deoxyribonucleic acid) adducts and excretion of nitrosamines in the urine samples[13].

The literature review revealed that there is a paucity of literature regarding the association among smokeless tobacco chewers in Belagavi region. Therefore, the study aimed to study the cytomorphological changes in the buccal mucosa of smokeless tobacco chewers and normal subjects.

Material and Method

This Cross sectional study was conducted in Belagavi region of Karnataka state in India,. The study groups were divided as Smokeless tobacco chewers (STC) and Non tobacco chewers (NTC). Ethical clearance was obtained from the Ethical Committee of the Institution and University. A total of 600 participants were studied in this study. The study population comprised fromBelagavi Institute of Medical Sciences (BIMS), Belagavi, Karnataka, India. Written informed consent was explained and taken from the participants in English and local languages (Kannada and Marathi). Study was done in the month of April 2013 to December 2016.

Inclusion criteria for age were300 smokelesstobacco chewers and 300 Non tobacco chewers between 18 to 65 years.Subjects with pre-existing oral cavity lesions, alcoholics and having recent viral infections and who had received radiotherapy or chemotherapy in last month

were excluded from the study. The study included 183 cases based on the prevalence of 13.9% in Karnataka[14].

Physical examinations of the subjects were done to record Respiratory rate (cycles/minute) Heart rate (Beats/minute).Anthropometric parameters was recorded for (Height (in cms), Weight (in kgs), Body Surface Area (Square meters), Body Mass Index (Kilogram/meter2),

Collection and chromatographic analysis of the urine samples for cotinine has been already reported by the same group[9].

Each individual was asked to rinse his mouth neatly by tap water. The exfoliated cells were taken by scrapping the buccal mucosa by using wooden/steel spatula and the scraped cells were taken on lean grease free glass slide and smears were prepared. All smears were stained by Papanicolaou technique using commercially available staining kit Rapid Pap. From each slide, minimum 100 cells were examined in high power magnification (400X) and location of micronuclei (MN) cells was examined by using 100X, 400X magnification. As per the Tolbert et al criteria identifying of micronucleus cells were done.

The completed questionnaires were entered into a database using MS Excel 2000. Frequency distributions and percentages were examined for each answer. Descriptive statistics,comparison among NTC and STC groups using Mann-Whitney U testand Spearman non parametric correlation analysis was used to indicate a measure of the correlation and the strength of the relationship. The statistical significance level was set at $P < 0.05$. The statistical analysis was conducted using SPSS version 26.

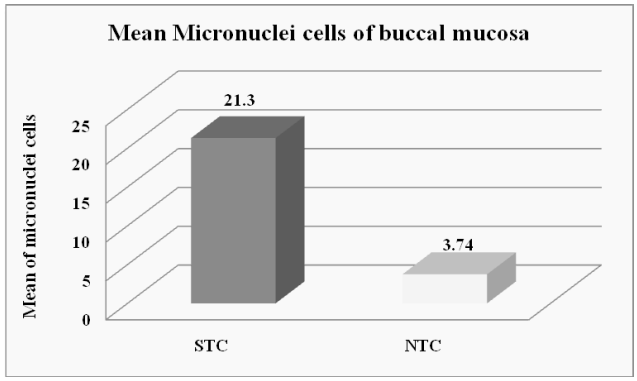
Results

The mean age of participants for NTC was (37.00±16.05) whereas for STC was (37.10±15.99). Distribution of sex for male and female for NTC was 222 (74%) and 78 (26%) respectively, and for STC male and female it was 214 (71.33%) and 86 (28.66%) respectively. The anthropometric data for height (cm) and weight (kg) mean ± SD in case of NTC and STC was 157.85±5.19 and 158.93±6.42 for height (cm) and 59.49±7.24 and 52.00±4.96 for weight (kg). The difference between mean values was statistically highly significant (<0.001).The mean ± SD values of Body Mass Index in Kg/m^2 (BMI), were 24.01±3.13 in NTC and 20.66±2.41 in STC group. Body Surface Area (BSA) m^2 the mean ± SD were 1.59±0.09 in NTC and 1.51±0.08 in STC group. The difference between mean values was statistically highly significant (<0.001). Heart rate in Beats/minute (HR) and Respiratory rate in cycles/minute (RR) on comparison with NTC and STC groups was statistically highly significant. Mean Urinary cotinine value in STC was enhanced as compared to NTC group (NTC, Mean SD, 23.48±11.08 & STC, Mean SD, 1563.68±1198.97) & were statistically highly significant statistically highly significant (<0.001)(Table/Fig 1). The comparison of buccal mucosal micronuclei cells by using Mann-Whitney U test was increased in case of STC (Mean SD of STC 21.30±10.55, 95% CI; 20.11 to 22.49 as compared to NTC Mean SD 3.74±3.43, 95% CI; 3.35 to 4.12) & was statistically highly significant (<0.001) (Table/Fig 2).The buccal mucosal micronuclei cells in case of STC showed strong positive association & statistically highly significant correlation with urinary cotinine levels (r= 0.692, p=<0.0001) by using spearman non parametric correlation analysis (Table/Fig 3).

Table 1: Mean urinary cotinine level in smokeless tobacco chewers and non tobacco chewers group[9].

Urinary cotinine levels (ng/mL)	Mean SD	P value
NTC	23.48±11.08	<0.001**
STC	1563.68±1198.97	

*Significant, ** Highly significant.



†STC-smokeless tobacco chewers, † NTC-Non tobacco chewers

Fig. 2: Comparison of mean value for micronuclei cells of buccal mucosa in smokeless tobacco chewers and non tobacco chewers group.

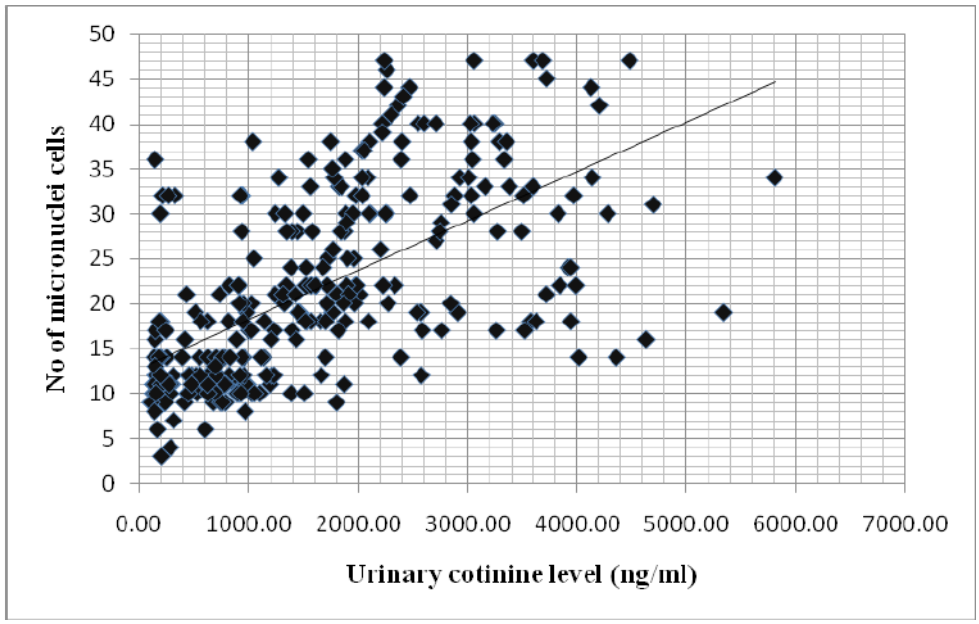


Fig. 3: Buccal mucosal micronuclei cells of STC showing strong positive correlation with urinary cotinine levels.

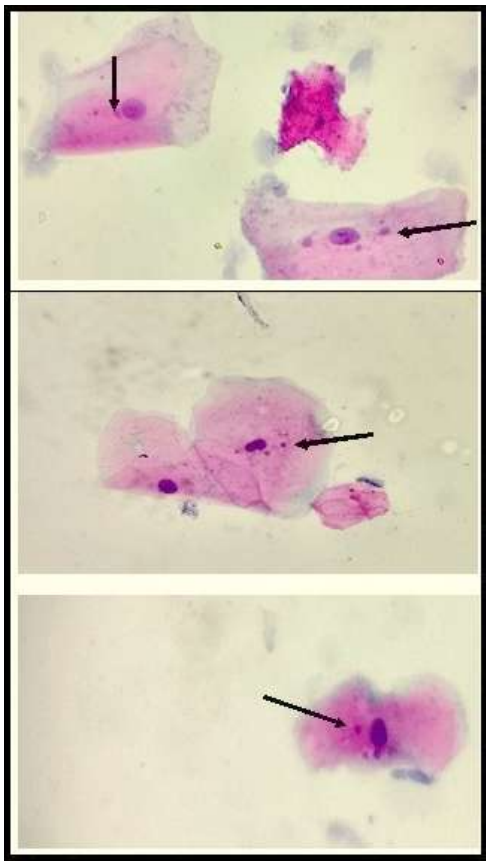


Fig 4: Photomicrograph showing exfoliated cells with micronuclei cells (Arrow) in STC stained by Papanicolaou stain, x 400.(Labomed Bionocular microscope Model LX 400)

Discussion

The present study was aimed to assess and compare micronuclei cells of buccal mucosa in STC and NTC and to establish the correlation between urinary cotinine levels of STC with above findings. Previous researchers[8,13,15,16] found a wide range of urinary cotinine levels which is also seen in the present study in STC and NTC 100.84 -5810 and 10.01- 59.02 ng/mL respectively. Several studies showed that urinary cotinine levels innonsmokers are always less than 100 ng/ml[17, 18]. The variation in range of cotinine depends on the tobacco chewer's dietary intake of nicotine, cotinine excretion, metabolic activity, passive smoking and environmental smoke[8].

From the present study highly statistically significant difference was found between STC and NTC group. Similar findings were also found among previous reports[19, 20, 21].The potential of carcinogenic and genotoxicants effect is very high among tobacco chewers. Habituated chewing tobacco users are the likely odds estimated for oral cancer development[19]. Micronuclei in oral exfoliated cells are the biomarkers of chromosomal damage caused by genotoxic agents from the tobacco and tobacco related substances[20]. Tobacco-specific nitrosamines present in the smokeless tobacco forms also play a significant role in causing the damage[19].

Urinary cotinine levels of STC statistically correlates with micronuclei of buccal mucosa cells (STC MN cells, r = 0.692, p <0.0001) in present study. This was similar to the findings of Poppel GV[22]who studied the serum cotinine levels in tobacco users. Oral carcinogenesis is a multistep process of accumulated genetic damage leading to cell dysregulation with disruption in cell-signaling,DNA repair & cell cycle events, which are fundamental to hemostasis. MN in oral exfoliated cells is a biomarker of chromosomal damage caused by genotoxic agents from tobacco related substances[20].

Conclusion

Early detection of a premalignant or cancerous oral lesion would improve the survival to a greater extent and also will reduce the morbidity associated with the treatment to a considerable extent. There is strong correlation between urinary cotinine levels of smokeless tobacco chewers and exfoliated buccal mucosal micronuclei cells. Thus the present study elucidates the link between rise in exfoliated buccal micronuclei and determination of urinary cotinine levels, which is an importantbiomarker and is valuable measure for diagnosis of health risk.

For definitive and sound results, still larger samples should be studied for longer duration. The buccal exfoliated cells should also be collected after cessation of habit to confirm the prognostic value of MN cells and level of genotoxicity. The cause of micronuclei formation due to tobacco use, different forms tobacco products, difference in the degree and mechanism of action of smokeless variants of tobacco and also the effects of cotinine levels in relation to occurrence of MN should be studied in detailed for strategic tobacco control program.

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Balanced Diet: Knowledge and Practice of Adolescents

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Abstract

Background: Adolescence is a stage of transition and psychological development. This period needs a well balanced diet for their better growth and development. Adequate knowledge regarding balanced diet may enhance the practice of adolescents regarding balanced diet.

Aim: The aim of the study was to determine the knowledge and practice regarding balanced diet among adolescents, to find the correlation between knowledge and practice and to find the association between knowledge, practice scores and the selected demographic variables.

Material and Method: Quantitative research approach and descriptive survey design was used for the study. The study was conducted in selected urban schools. Using non probability purposive sampling technique, 100 adolescents between the age group of 10- 17 years were selected as study sample. The structured knowledge and practice questionnaire on balanced diet was used to assess the knowledge and practice regarding balanced diet. Data was analysed using descriptive and inferential statistics.

Result: Study findings revealed that 4% of study samples had inadequate knowledge, 64% of study samples had adequate knowledge and other 32% of study samples had good knowledge on balanced diet. 2% of study samples had poor practice and other 98% of study samples had good practice regarding balanced diet. There found a significant positive correlation ($r=0.52$) between knowledge and practice scores. Also it showed a significant association between knowledge scores and selected demographic variables ($p<0.05$).

Conclusion: It was concluded that the adolescents have good knowledge and practice on balanced diet.

Keywords: *Knowledge, practice, adolescents, balanced diet.*

Introduction

According to WHO, adolescence is a period between the age of 10 to 19 years. Adolescents constitute 18 to 25% of the population in member countries of South East Asia Region. Adolescent is a period of accelerated physical growth, social and psychological maturity, sexual maturity, experimentation, development of adult mental process[1] but in this period, a high levels of stress and anxiety develops in each adolescents. Adolescence is also a time of busy schedule. The high stress in some adolescents, may be related to eating disorders as well[2]. It is estimated that during adolescence period, they gain 25% of adult height, 50% of adult weight and 40% of adult bone mass[3].

During adolescence the rate of physical growth actually increases. This sudden growth is associated with hormonal, cognitive and emotional changes that make adolescence an especially vulnerable period of life. There is a greater demand for calories and nutrients. At the same time, adolescence is a time of changing lifestyles and food habits which can affect the intake and nutrition of adolescents. It is also seen that adolescents

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strive for individuation, that means more opportunity to assert food choices and expand or narrow healthy options. Studies have revealed that despite possessing considerable food knowledge, many adolescents find it difficult to follow healthy eating recommendations and often consume food that they think is healthy.[4] Adolescence is a nutritionally vulnerable time period. Poor eating habits formed during adolescence period can lead to obesity and diet-related disease in later years. In addition, the high incidence of dieting behaviours can contribute to nutritional inadequacies and to the development of eating disorders.[5] Food choice patterns established during youth may likely influence long-term behaviour[6] Nutrition issues may also arise due to the intake fast food, snack choices, sport nutrition and overweight. Adolescents are not aware of the potential health risks associated with poor habits[7].

It is reported that 49% of adolescent girls (15 years of age) are under height and 67% are underweight.[8] The prevalence of overweight in girls was 24%, obesity 13% and underweight was 14%. The prevalence of anaemia [Hb<12gm/dl] was 29%.[9]In a study it was observed that majority of subjects, i.e., 83.3% were in the habit of skipping at least one meal daily.[10] In another study it was also seen that majority of the study participants had regular meals (72%) and breakfast (80.8%). 46.8% consumed fruits less than 3 times per week, 58% had fried food twice or more per week and 40.5% consumed less than 2 litre of water a day.[11]

Balanced diet helps adolescents to maintain good health and to promote growth and development. Adequate knowledge on balanced diet would improve the practices of adolescents regarding consumption of balanced diet. Hence the researchers were interested to assess the knowledge and practice regarding balanced diet among adolescents.

Materials and Method

Quantitative research approach with descriptive survey design was used for the study. The study was conducted in selected schools at Mangaluru. The sample comprised of 100 adolescents between the age group of 10-17 years. Non probability purposive sampling technique was used to select the sample. Ethical principles followed during data collection as in the guidelines of institutional ethics committee. The tool used for data collection were structured knowledge questionnaire (reliability was 0.8) and practice questionnaire (reliability was 0.7). The baseline characteristics of adolescents including dietary behaviours were collected. There were 25 questions for knowledge on balanced diet, 20 questions on balanced diet practice which was a five point rating scale. The data was analyzed by using descriptive and inferential statistics.

Findings: The study results showed that majority (30%) of the sample belonged to the age group of 10-11 years, majority (56%) were females, majority (44%) were studying in 5- 7 standard,majority, 87% are living in nuclear family, majority (84%) of adolescents were Muslim by religion, majority (20%) had family income greater than Rs. 40,000/ per month, Majority (79%) of adolescents were day scholar, majority(86%) were residing in urban area, majority (63%) were receiving pocket money, majority (82%) received information regarding balanced diet, 40% of adolescents received information from school teachers.

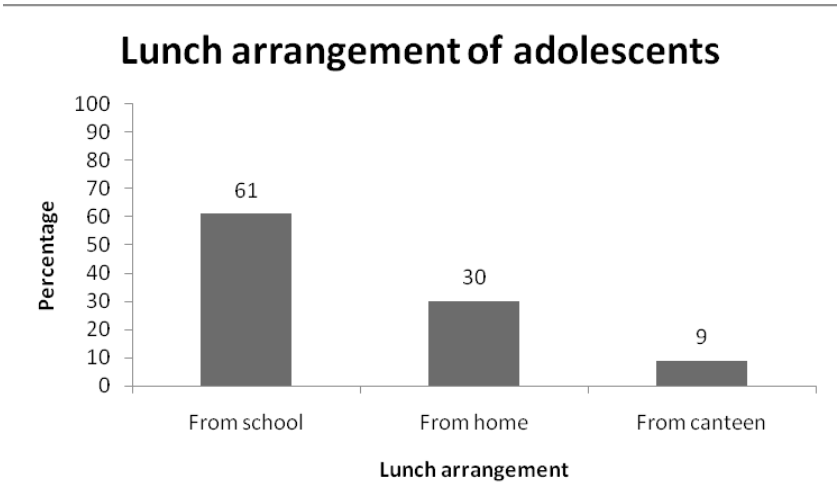

Fig 1: Bar diagram showing the lunch arrangement for adolescents

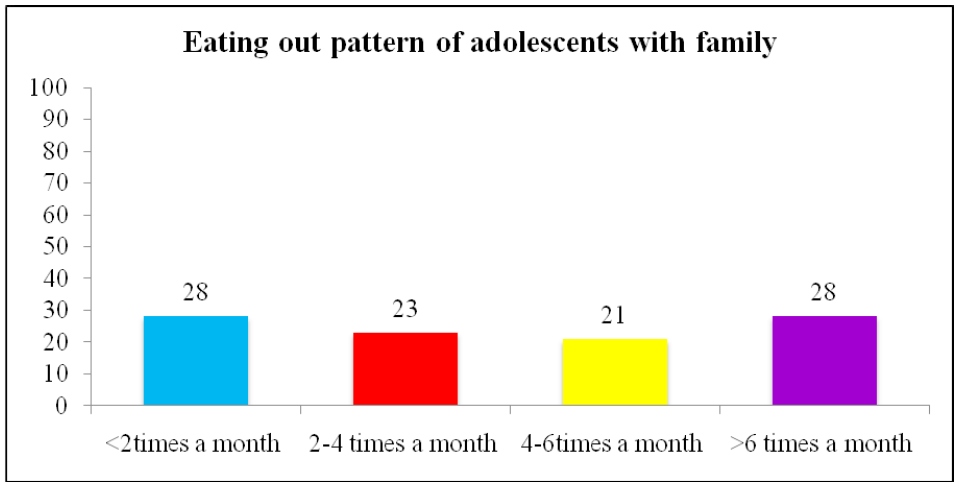

Fig 2: Bar diagram showing the eating out pattern with family

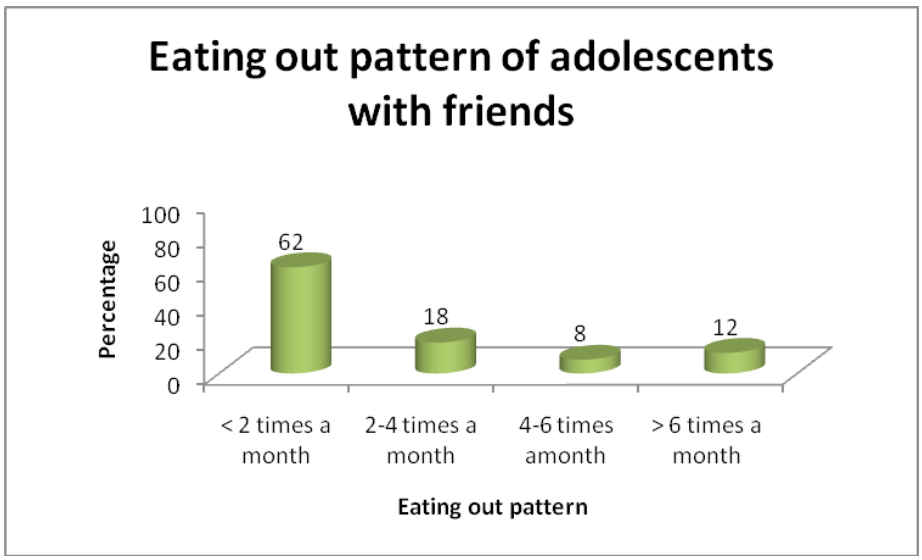

Fig 3: Bar diagram showing the eating out pattern with friends

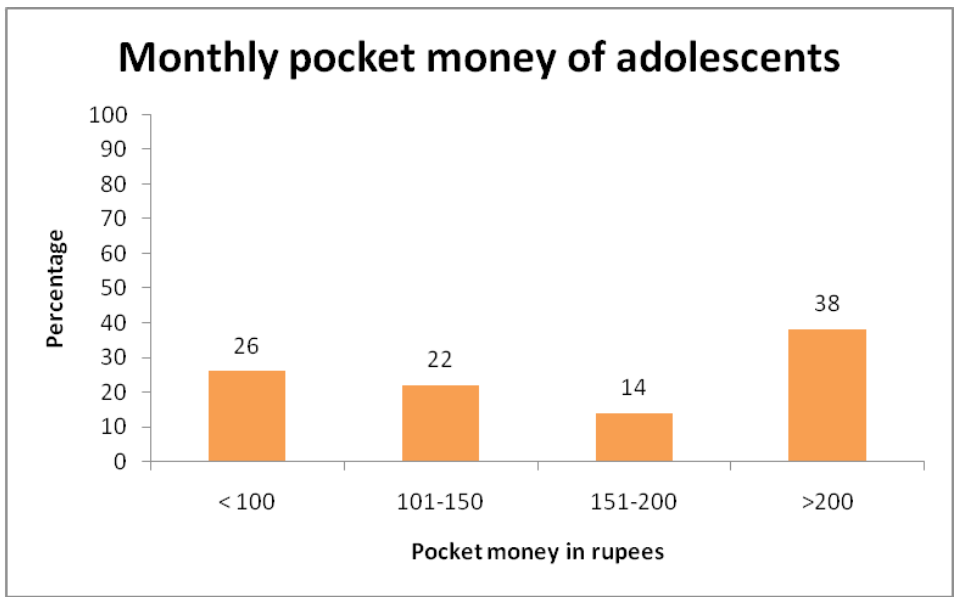

Fig 4: Bar diagram showing the pocket money amount of adolescents per month

Table 1: Frequency and percentage distribution of adolescents according to the arbitrary grading of their knowledge scores n=100

Sl. No.	Knowledge score	Arbitrary Grading	Percentage
1	≤8	Inadequate knowledge	4
2	9-16	Adequate knowledge	64
3	17-25	Good knowledge	32

The data in table 1 shows that 4% of study samples had inadequate knowledge, 64% of study samples had adequate knowledge and other 32% of study samples had good knowledge on balanced diet.

Table 2: Frequency and percentage distribution of adolescents according to the arbitrary grading of their practice scores n=100

Sl. No.	Practice score	Arbitrary Grading	Percentage
1	≤ 40	Poor practice	2
2	>40	Good practice	98

The data in table 2 shows that 2% of study samples had poor practice and other 98% of study samples had good practice regarding balanced diet.

Regarding the practice of balanced diet, it was seen that majority (74%) of the adolescents agreed that they consume breakfast every day. Majority (35%) argued that they never skip meals. Majority (37%) consumed vitamin supplements 4 days a week and 37% consumed mineral supplements every day. Majority (56%) of the adolescents verbalized that they eat three base meals every day. Majority (61%) verbalized that they drink at least 8 glasses of water daily. Majority (52%) argued that they take carbonated beverages 1–2 days a week. 50% said that they do not record what they eat. Adolescents also reported that their daily diet contains breads / cereals / pasta / potatoes / rice daily (74%), fruits such as apples, bananas, oranges etc (82%), vegetable of any kind (64%), dairy products (75%). It was also seen that majority (32%) consume jams, cookies, candies or other sweets daily, majority (34%)snack on foods like potato chips, cakes, etc 3–4 days a week,majority (36%) snack on fruit salads 3–4 days per week, majority (44%) eat fast foods like pizza, sandwich etc. 1–2 days a week, majority (27%) seek out nutrition information every day in the newspaper, TV, school etc. Majority (36%) of adolescents verbalized that they get knowledge on food habits from parents/teachers, majority (29%) have the habit of eating food while seeing TV/mobile phone/ computer every day.

The study showed that there is a significant positive correlation between knowledge and practice scores of adolescents regarding balanced diet,($r = 0.52$). It was also seen that there is a significant association between knowledge score and grade studying in ($\chi^2 = 51.64$, $p<0.05$), knowledge score and area of residence ($\chi^2 = 117.473$, $p<0.05$), knowledge score and lunch arrangement ($\chi^2 = 65.716$, $p<0.05$). It was seen that there is no significant association between practice score and the selected demographic variables ($p>0.05$) .

Discussion

The current study was conducted among the adolescents studying in urban area. It showed that majority (64%) of study samples had adequate knowledge on balanced diet. These findings are in line with a study[11] which showed that 59%of adolescents had quite good knowledge about balanced diet. It was also supported by a study which was conducted on nutrition knowledge, attitude and practice of college students which showed that there was significant difference in nutrition knowledge, attitude and practice score ($p<0.05$).[9] But another study contradicted the present study findings where 41% of the subjects had low knowledge regarding balanced diet.[1]

In the present study 98% of sample had good practice regarding balanced diet. This finding is in line with a study[11] finding where most of adolescent girls had a well-balanced diet practices (53.5%) .Another study also has confirmed this result that the eating behaviour of women is positively correlated with nutrition knowledge[12]. However, in contrary another study[13] showed that nearly 85.6% of students aware of the concept of a balanced nutritious diet (nutritionally balanced food), but only a few (7%) applying this concept when choosing food.

Regarding the practice of balanced diet, majority (74%) of the study participants verbalized that they consume breakfast every day, majority (35%) said that they never skip meals. Other two studies showed a different result where more than a half of respondents rarely eat breakfast, only a third of the subjects have their breakfast every day, and skip breakfast was 15.5%.[11] Yet another study[14] found that 14.9% of students skipping their breakfast.

In the present study majority (56%) of the

adolescents verbalized that they eat three base meals every day. Majority (64%) consume vegetable of any kind every day and majority (82%) adolescents consume fruits every day. These findings are in line with a study[11] where more than half of the subjects were eating three times a day (54.5%), consumption of vegetables 2 times per day (48.8%) and most of the female adolescent eat fruit once a day (47.8%). Another study[15] also found that 56% of female adolescent (14-16 years) in secondary school had their meals 3 times a day and one more study[16] found that 80% of students consumed vegetables 2 times per day.

Conclusion

The present study concluded that the adolescents have good knowledge and practice on balanced diet .The school, parents and peer influence the nutritional knowledge and practice of balanced diet among adolescents. As told by the sample, the current study setting provides nutrition education to the children. Where as in the other studies it was proven that adolescents lack knowledge and practice of balanced diet. Therefore it is essential to create an awareness among the adolescents regarding the sound knowledge and practice to balanced diet and to promote their growth and development.

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Conflict of Interest: No conflict of interest.

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Influence of Self-Efficacy on Student Engagement of Senior Secondary School Students

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Abstract

The present study examined to investigate the influence of self-efficacy on student engagement of Senior Secondary School students. The respondents were students from senior secondary school of Jammu and Kashmir. A Sample of 400 senior Secondary School Students (200 boys and 200 girls) were selected from Jammu and Kashmir by employing simple random sampling. T-test, correlations and regression were employed to analyze the data. The study indicated that (a) there exists significant difference between senior Secondary School boys and girls with their self-efficacy (b) there exists Significant Difference Between Private and Government senior Secondary school Students with their self-efficacy (c) there exists Significant Difference Between senior Secondary School Boys And Girls with their student engagement (d) there exists significant difference between private and government senior Secondary school Students with their student engagement. It revealed that significant relationship was found between self-efficacy and student engagement of senior secondary school students. It also found the self-efficacy had significant influence on student engagement of senior Secondary School Students.

Keywords: *Self-efficacy, Student Engagement, Senior Secondary School students.*

Introduction

Self-efficacy refers to a man's conviction that they can proficiently completed at an allocated levels in a specific academic part of information. A man's trust in their ability to make, executes, and guides execution with the ultimate objective to deal with an issue or accomplish an endeavor at an appointed level of capacity and aptitude. Students who are sure about their capacity to execute, to sort out and manage with their basic reasoning or activity execution at an allocated levels of fitness is showing high self-efficacy. Self-efficacy is by and large viewed as a multidimensional develops separated over different spaces of working. Self-efficacy is grounded in principle by[1.] As per Self-Efficacy assumption, Self-Efficacy is a "person's trust in their capacity to compose and execute a given strategy to take care of an issue or achieve an assignment". As indicated by[2] self- efficacy alludes to people's feelings that they can effectively perform given errands at assigned levels. Self-efficacy is the conviction about person's assessed capacity to play out a given task. Self- Efficacy contains convictions individuals have about their capacity to achieve specific results.[3] It is noticed that self-efficacy is the certainty a man has in realizing a particular result. Self-efficacy as persons' confidence about their abilities to make appointed levels of execution that actions affect over events that impact their lives. As shown by him, it chooses how people feel, think, and conscious themselves and carry on.[4] Self- efficacy suggested proposes that Academic Self- efficacy can change in quality as a component of undertaking trouble. Two general classes of academic hope convictions have been assumed. Understanding the distinction between these two types of hope convictions is very important as people can trust that a specific conduct will deliver a specific (result desire), yet may not trust they can play out that conduct (efficacy desire)". Found that there exists a positive correlation between Mental Health of

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senior secondary school Boys and girls with their Life Skills and Self-Efficacy.[5] Results demonstrated that self-efficacy mediated the correlation between academic performance and performance accomplishments.[6] found that higher level of academic self-efficacy is positively correlated with scholastic performance.[7]

Student Engagement: The idea of student engagement has progressively increased the consideration throughout the most recent decade.[6] It comprehensively alludes to Students' Engagement in actions that gave up to their knowledge accomplishments and their sense of belongings with their educational network. It additionally included actions other than those straightforwardly identified with course work, for example, non necessary companion learning exercises and administration exercises, for example, positions of authority in student tutoring or study group assistance. Also, engagement is how much students are engage in their learning actions and their commitment is emphatically connected to a large group of preferred results, include student satisfaction and determinations. This definition infers the utilization of three interrelated criteria to evaluate Student engagement levels namely:

Emotional Engagement: Refers to the connections among students and their teachers, schoolmates and school. This has likewise been called 'recognizable proof' with school and learning rehearses. Students are engaged in when they feel incorporated into the school and feel a passionate security with the school, its teachers and their companions.

Cognitive Engagement: It can be understand as a student's psychological importance in their own knowledge. At the point when a student is cognitively engage in, student believe, spotlight on accomplishing objectives, are stretchy in their endeavor and familiarize you to dissatisfaction. This is unique in relation to high achievement a student who is performing great may at present be disengaged whether they are wandering and not inspired to endeavor themselves more than is vital to obtain by.

Behavioral Engagement: Refers to students' involvement in classroom activities and in learning. This includes holding fast to behavior rules, leaving to exercises as necessary and reaching at classes on time. Essentially, Behavioral Engagement refers to the educational performances that are critical for high students' implementation, which may include cooperation and communication with companions. Moreover, it covers students' investment in various elements of school life, e.g., school community activity and extracurricular actions.

The present study is intended to find out how Student Engagement is related to Self-efficacy. Movements like universlization of elementary education as a fundamental right have improved the quality and quantity of school education in India. Kashmir, being a role model, has better education system as compared to other states. Self-efficacy has a significant task in influencing students' academic Success and Student engagement. Many teachers complain that student's are giving less important to their academic activities, because they were not able to cope up effectively with academic success. Improved Self-efficacy may help to increases Student engagement. In this study investigators try to find out whether Self-efficacy had any significant influence on Student engagement.

Objectives:

1. To compare the difference of self-efficacy of senior secondary school students on the based on gender.
2. To compare the difference of student engagement of senior secondary school students on based on gender.
3. To find out the relationship between self-efficacy and student engagement of senior secondary school students.
4. To find out the influence of self-efficacy on student engagement of senior secondary school students.

Hypotheses:

1. There exists no significant difference of self-efficacy of senior secondary school students on the basis of Gender.
2. There exists no significant difference of Student engagement of senior secondary school students on the basis of Gender.
3. There exists no significant relationship between Self-efficacy and Student engagement of senior secondary school students.
4. There exists no significant influence of self-efficacy on Student engagement of senior Secondary School Students.

Methodology

Descriptive Survey Method was used. Data was collected from Senior Secondary School students of Jammu & Kashmir, by employing simple Random Sampling technique. The sample consists of 400 senior secondary school Students.

Instruments:

1. Self-Efficacy Scale: this scale was developed by Bhatnagar and Mathure. Self-Efficacy is the confidence that one can successfully complete in a given circumstance. Self-Efficacy Scale plans to study the dimension of self-efficacy in any age group over 14 years. It comprises of 22 items, managing eight factors. Reliability co-efficient of the scale was estimated by test-retest and found 0.79 to 0.86.
2. Student Engagement Scale: This scale was developed by Dogan (2014) and was adopted in Indian context. The scale is a 5-point Likert Scale consisting of 22 items and 3 sub-dimensions (cognitive, emotional, and behavioral engagement). The final set of statements was check for internal consistency using SPSS-22 version. The Cronbach's alpha for the final set of statements was found out to be .765

Procedure: Initially the investigators randomly identified various secondary schools and contacted the authorities of the secondary school personally. The purpose, objectives and relevance of the study were explained to the head of the institution. Then, the tools were directed to the participant after giving necessary instructions to them. Reassurance was given to each that the information collected from them would be used only for research identity and purpose would not to be disclosed. The scoring was done as per the manual and entered the data in to a spread sheet for further Statistical Analysis by using t-test, correlation and Regression to analyze the data.

Results and Discussions

Table 1: There exists no significant difference of self-efficacy of senior secondary school students on the basis of Gender.

	Gender	N	Mean	S.D	t-value	Levels of significance
Self-efficacy	Boys	200	88.03	4.40	6.33	Significant
	Girls	200	84.91	4.96		

According to the above table reflects that the mean scores of boys and girls of senior secondary school students is 88.03 and 84.91 respectively. The S.D for boys and girls Senior Secondary School Students is 4.40 and 4.96 respectively. Further, the t-value is 6.33 which is significant at 0.05 level. So, that there exist significant difference between Senior Secondary school girls and boys in their self-efficacy.

Further it is evident from the table that mean score (88.03) of boys' Senior Secondary School Students was greater than (84.91) of girls Senior Secondary School Students. So, it can be interpreted that boys' Senior Secondary School Students had higher self-efficacy than girls' senior secondary school students.

According to the above results, it confirmed that the hypothesis no. 1, "there exists no significant difference of Self-efficacy of Senior Secondary School Students on the basis of gender" is thus rejected.

Table 2: There exists no significant difference of Student engagement of senior secondary school students on the basis of Gender.

	Gender	N	Mean	S.D	t-value	Levels of significance
Student engagement	Boys	200	90.98	4.18	7.51	Significant
	Girls	200	88.06	3.49		

According to the above table reflects that the mean scores girls and boys of Senior Secondary School Students are 90.98 and 88.06 respectively. The S.D for girls and boys Senior Secondary School Students is 4.18 and 3.49 respectively. Further, the t-value is 7.51 which are significant at 0.05 levels.. So, that there exist Significant Difference Between Senior Secondary School Girls and Boys in their Student engagement.

Further it is obvious from the table that Mean score (90.98) of Boys Senior Secondary School Students was greater than (88.06) of Girls Senior Secondary School Students. So, it can be interpreted that Boys Senior Secondary School Students had higher Student engagement than Girls Senior Secondary School Students.

According to the above results, it can be confirmed that hypotheses no 2 i.e. "there exists no significant difference of Student engagement of Senior Secondary School Students on the basis of gender" is thus rejected.

Table 3: There exists no significant relationship between self-efficacy and student engagement.

		Student Engagement	Self-efficacy
Student engagement	Pearson's Correlation	1	.316**
	(sig.2 tailed)		.000
	N	400	400
Self-efficacy	Pearson's Correlation	.316**	1
	(sig. 2 tailed)	.000	
	N	400	400

**correlation is significant at 0.01 levels of significance (2-tailed).

According to the above table it can be seen that Self-efficacy significantly correlated with Student engagement. It is observed that there exists a significant relationship between Self-efficacy and Student engagement of Senior Secondary School Students. From the above table it reflects that coefficient of correlation between Self-efficacy and Student engagement of senior secondary school students is .316 that is significant at 0.01level of significance. This indicated that there exists a significant relationship between Self-efficacy and Student engagement of Senior Secondary School Students. It also shows that Self-efficacy had significant Influence on Student engagement of Senior Secondary School Students.

Therefore hypothesis 3, namely "there exists no significant relationship between Self-efficacy and Student engagement" stands rejected.

Thus self-efficacy increased student engagement. Self-efficacy plays an essential position in determining student engagement. Students' who have possessed high self-efficacy are very much more engaged in their studies. It is same as in the case that Student engagement and that those who have high self-efficacy show more Cognitive, Behavioral and Emotional engagement. Manikandan and Neethu (2018) supported our study and found that Student engagement is significantly related to academic Stress and Self-efficacy.

There exists No Significant Influence of Self-Efficacy on Student Engagement.

Table 4: Model Summary for Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.316*	.100	.098	3.899

According to Above table shows the correlation coefficient of Self-efficacy and Student engagement of adolescents. The coefficient of correlation is .316* and its square is 0.100 Regression suggests that predictive variables i.e. Self-efficacy can explain 1.0% variance of the criterion variable (Student engagement).

In Order to study the influence of self-efficacy on student engagement ANOVA has been applied on the influence of self-efficacy on student engagement.

Table 5: Summary of Anova by Regression

Model	Sum of square	Df	Mean of square	F	Sig
Regression	673.494	1	673.494	44.304	.000*
Residual	6050.203	398	15.202		
Total	6723.698	399			

According to the above table shows that the results of ANOVA of self-efficacy on student engagement. It is clear that acquired F-value is (44.304) which are statistically significant at 0.01 level of significance which shows the statistically significant Relationship Between self-efficacy and Student engagement. The predictive variable (Self-efficacy) can influence the criterion variable (Student engagement). The above findings revealed that Self-efficacy has significant influence on Student engagement. So there exists significant influence of Self-efficacy on Student engagement. Therefore, regression analysis is allowed and feasible.

Therefore hypothesis 4, namely "there exists be no significant influence of Self-efficacy on Student engagement" stands rejected.

Table 6: Summary of coefficient of regression

Model	Unstandardized Coefficient		Standardizes Coefficient	T	Sig.
	B	Std. Error	Beta		
(Constant)	66.734	3.422	.316	19.503**	.000
Self-efficacy	.263	.040		6.656*	.000

According the above table with B=.263 and t=6.656 which is significant at 0.05 level of significance. It implies that Self-efficacy plays an important role in predicting Student engagement. So, it can be revealed that Self-efficacy had significant Influence on Student engagement. The regression equation for predicting student engagement by the predictor variable i.e. Self-efficacy. Therefore, the regression equation formulated from these two variables is given below:

Student engagement = 66.734 + .263× Self-efficacy

Conclusions

The study presented the following conclusions:

- Based on the result analysis it found that there exist significant difference between senior secondary school Boys' and Girls'in their self-efficacy. Boys of senior secondary school students had higher self-efficacy than girls of Senior Secondary School Students.
- There exist significant Difference Between Private and Government senior secondary school students in their Self-efficacy. Government Senior Secondary School Students had higher Self-efficacy than Private senior secondary school Students.
- There exists Significant Difference Between Senior secondary school Girls and Boys in their Student engagement. Boys had higher Student engagement than Girls.
- There exists significant difference between in Student engagement among Seniorsecondary school students on the basis of Type of School. Government Senior Secondary School Students had higher than Private Senior Secondary School Students.
- Self-efficacy had significant Influence on Student engagement. There exists significant influence of Self-efficacy on student engagement.
- There exists a Significant relationship between self-efficacy and Student engagement of Senior secondary school students. It also shows that Self-efficacy had significant Influence on Student engagement of Senior Secondary School Students.

Implications of the study: The findings revealed that self-efficacy is significantly correlated with Student engagement; this also has some suggestion. Since self-

Efficacy alludes to an individuals' opinion of their capability to arrange and achieve the plan of activity essential to bring about prearranged sorts of engagement and worried about the estimation of what one can achieve with the aptitudes one presently achieves. It suggests that students who are Self-efficacious will in general produce and test elective strategies of activities when they don't at first make progress. This implies that students ought to be positive to create, have or develop efficacy disposition. This is essential in light of the fact that it could fill up in as a defense that may support the students up regardless of their experience to be engaged. If students are given tasks that are challenging but not too difficult and they experience success upon completion of these tasks that Self-efficacy to learn may increase. As Self-efficacy to learn increases, so will interest, value, and utility. A strategy such as this one would be very useful for teachers to implement. Teachers can organize and design their instructions to have a constructive result on students' self-efficacy to learn which would lead to improved Student engagement and improved learning.

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Psychological Effects of Trauma to Anterior Teeth

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Abstract

Dental trauma has a very distressing experience on physical, emotional and psychological aspects of the patient. The aim of the study was to determine the psychological effects of anterior dental trauma on patients.

A questionnaire study was carried out to know the psychological aspects of trauma to anterior teeth based on the Oral Health Impact Profile (OHIP-14) index. It is regarded as the most comprehensive tool for measuring Oral Health Related Quality of Life. This study concentrated only on psychological discomfort and psychological disability. Each item was scored on a five-point scale ranging from "never" (coded 0) to "very often" (coded 4).

The statistical significance of the scores thus obtained and the mean levels of the severity scores between genders and age groups were calculated using the statistical chi-square test. In our study psychological effects to anterior teeth trauma was most observed in the age group of 18-25. Interestingly when the observation was monitored across genders, we observed large psychological effect in females when compared to male gender.

Keywords: *Anterior dental trauma, psychological effects, OHIP index.*

Introduction

Health is described "a complete state of physical, mental, and social well-being of an individual and not just mere absence of disease" (WHO, 1948). This concept of health embraces the bio-psychosocial model of health into which physical functioning, symptoms, emotional and social well-being are holistically incorporated (Kleinman, 1988). Hence health related researchers have rightly focused on health as a multi-dimensional construct.[1]

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Oral Health Related Quality of Life (OHRQoL) forms an integral part of general health and well-being and is recognized by the WHO as an important segment of the Global Oral Health Program (WHO, 2003).[2] It is imperative to evaluate the extent to which the oral diseases impacts on ones normal functioning and psychology.[3]

In the field of dentistry, OHRQo Laddress four dimensions: pain and discomfort; functional aspects concerning the ability to chew and swallow food without difficulty, speaking and pronunciation; appearance and self-esteem; and social aspects reflecting social interaction with others.[4]

So it is fair to qualify that oral health affects various aspects of social life, including social interaction, self-esteem, school and job related performance, specifically when the issues related to anterior dental trauma are involved. Incidents arising from physical fight, traffic accident and sporting injuries contributes the major cause of anterior dental trauma. [5]

Dental trauma is usually a pain filled experience for most people which can impair oro-facial function, negatively affecting growth, aesthetics and occlusion.[6] Unlike a chronic condition, severe dental trauma causes immediate and unexpected pain. The obvious economic cost apart, it can trigger a series of socio-economic consequences affecting the quality of life and possibly lead to the absence from college or work, disturbances during sleep and changes in the normal daily schedule. This could be further compounded by the stress patients may experience as a result of unhelpful behaviour by their peers, society and family members. The impact is quite significant when anterior dental trauma is involved, which is what this study tries to document via Oral Health Impact Profile (OHIP-14) survey.

Since anterior dental trauma is often caused by accidents that cause life-threatening injuries, limb fractures or concussion, emergency care prioritizes on more important issues. As a consequence of this delay, sometimes it becomes impossible to provide timely treatment that would have otherwise allowed the affected front tooth to be saved.[7]

Dental trauma frequently affects the upper central incisors, most likely because of their position in the mouth and also having less of a protection in comparison with the other teeth. Consequently the position and appearance of the anterior teeth have very important psychological and social impacts on the quality of life of the patient. When injuries to incisors produce pain, poor aesthetics/disfigurement or other psychological effects, patient may avoid smiling or laughing and this can affect their social relationships. So overall this has a very distressing experience on physical, emotional, and psychological levels of the patient which is a matter of great concern.[8,9,10]

OHIP-14 index assesses seven dimensions of impacts of oral conditions on one's quality of life including functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap.[11] This is widely regarded as the most comprehensive assessment for measuring OHRQoL.

The aim of the study was to determine the psychological effects of anterior dental trauma on patients and to assess the impact of these injuries on the quality of life based on OHIP-14 index.

Materials and Method

The study was conducted in the Department of Conservative Dentistry & Endodontics, AB SMIDS, Karnataka, India. Ethical clearance was obtained from Nitte (Deemed to be University), Cert.No: ABSM/EC07/2019.

The total numbers of subjects were 256 based on approximately 20% incidence of anterior tooth fractures. Patients in the age group of 18 and above with anterior tooth trauma were included in the study. Participation was voluntary, anonymous and started off with patients consent.

Study was carried out to know the psychological aspects of trauma to anterior teeth based on the OHIP-14 index, specifically w.r.t psychological discomfort and disability. Each item was scored on a five-point scale ranging from "never" (coded 0) to "very often" (coded 4).[1,2,10,12]

Findings:

1. Gender comparison

Table 1: Psychological discomfort scores

			Psychological discomfort scores					Total
			Never	Hardly ever	Occasionally	Fairly Often	Very Often	
Gender	Male	Count	5	18	112	22	1	158
		% within gender	3.2%	11.4%	70.9%	13.9%	0.6%	100.0%
	Female	Count	2	1	8	75	12	98
		% within gender	2.0%	1.0%	8.2%	76.5%	12.2%	100.0%
Total		Count	7	19	120	97	13	256
		% within gender	2.7%	7.4%	46.9%	37.9%	5.1%	100.0%

Chi-Square- 13.438 P= 0.001 sig

Table 2: Psychological disability scores

			Psychological disability scores					Total
			Never	Hardly ever	Occasionally	Fairly Often	Very Often	
gender	Male	Count	0	128	21	5	4	158
		% within gender	0.0%	81.0%	13.3%	3.2%	2.5%	100.0%
	Female	Count	6	15	51	18	8	98
		% within gender	6.1%	15.3%	52.0%	18.4%	8.2%	100.0%
Total		Count	6	143	72	23	12	256
		% within gender	2.3%	55.9%	28.1%	9.0%	4.7%	100.0%

Chi-Square-108.365 P= 0.001 sig

2. Age comparison:

Table 3: Psychological discomfort scores

			Psychological discomfort scores					Total
			Never	Hardly ever	Occasionally	Fairly Often	Very Often	
age	18-25	Count	14	12	20	90	2	138
		% within age	10.1%	8.7%	14.5%	65.2%	1.4%	100.0%
	25-35	Count	0	1	50	34	1	86
		% within age	0.0%	1.2%	58.1%	39.5%	1.2%	100.0%
	35-45	Count	9	12	10	1	0	32
		% within age	28.1%	37.5%	31.2%	3.1%	0.0%	100.0%
Total		Count	23	25	80	125	3	256
		% within age	9.0%	9.8%	31.2%	48.8%	1.2%	100.0%

Chi-Square=108.433 p=0.001

Table 4: Psychological disability scores

			Psychological disability scores					Total
			Never	Hardly ever	Occasionally	Fairly Often	Very Often	
age	18-25	Count	2	6	14	88	28	138
		% within age	1.6%	4.7%	10.9%	63.8%	21.9%	100.0%
	25-35	Count	1	10	42	23	10	86
		% within age	1.2%	11.6%	48.8%	26.7%	11.6%	100.0%
	35-45	Count	2	9	11	8	2	32
		% within age	6.2%	28.1%	34.4%	25.0%	6.2%	100.0%
Total		Count	5	25	67	119	40	256
		% within age	1.9%	9.7%	26.1%	46.4%	15.6%	100.0%

Chi-Square=67.451 p=0.001

The OHIP-14 data were captured and details were entered into SPSS tool (v.16; IBM Corp, Somers, NY) for further analysis. The dependent variables were based on the responses to the OHIP-14 were made on a five-point ordinal scale ranging from ‘‘never’’ coded as ‘‘0’’, ‘‘hardly ever’’ coded ‘‘1’’, ‘‘occasionally’’ coded ‘‘2’’, ‘‘fairly often’’ coded ‘‘3’’, to ‘‘very often’’ coded ‘‘4’’. The statistical significance of the scores and the mean levels of the severity scores between genders and age groups were calculated using the statistical chi-square test.

Above Tablescaptures the percentage distribution of patients responses across the two dimensions namely psychological discomfort and psychological disabilityfor

the scale ranging from "never" to "very often" (p=0.001).

In Table-1, which is related to psychological discomfort scores related to breakdown w.r.t gender, around 70.9% of the male individuals experienced "occasional" psychological discomfort compared to 76.5% impact of "fairly often" in females (p=0.001).

In Table-2, which is related to psychological disability scores related to breakdown w.r.t gender, around 81% of the male individuals experienced "hardly ever" psychological disability compared to 52% impact of "occasional" in females (p=0.001).

In Table-3, which is related to psychological discomfort scores related to breakdown w.r.t age, around 48.8% of the individuals experienced the impacts of "fairly often". Largest contribution to this came from the age group of 18-25 with 90 individuals out of 138(65.2%) experiencing this impact (p=0.001).

In Table-4,which is related to psychological disability scores related to breakdown w.r.t age, around 46.4% of the individuals experienced the impacts of "fairly often". Largest contribution to this came from the age group of 18-25 with 88 individuals out of 138 (63.8%) experiencing this impact (p=0.001).

Age group 18-25 showed higher scores in the psychological disability and discomfort dimension. The comparison across genders showcased a similar significantly higher uptick for women in the psychological dimensions.

Discussion

Psychological trauma occurs as a consequence of an overwhelming amount of stress experienced that exceeds one's ability to cope or integrate the emotions involved with that experience. Effects of the trauma varies according to one's subjective experiences. So, not all who experience a traumatic event will become traumatized psychologically.

Traumatic injuries constitute painful and distressing event with multilevel consequences for patient and their families. Despite being confined in a small body region as is the oral cavity, dental trauma constitutes a relatively common finding in population-based studies. Andersson noted that although the oral region comprises 1 percent of the total body area, oral injuries account for almost 5 percent of all injuries and for a higher proportion among early adults.

Among these anterior dental trauma forms an important and visible part of human anatomy. These are characterized as major public health problems due to their high prevalence and serious aesthetic and functional consequences. Such trauma can significantly disrupt patients' normal functioning and impact dramatically on the quality of life.

Since anterior dental trauma is often caused by accidents that cause life-threatening injuries, limb fractures or concussion, emergency care prioritizes initially on more critical issues. As a consequence of this delay, sometimes it becomes impossible to provide timely treatment that would have otherwise allowed the affected front tooth to be saved.[8]

The psychological and social impact of dental trauma is widely recognized as having consequences that can affect emotional balance, social contact and also well-being of the patient. There is an evidence of increasing necessity to use indices for measuring the impact of oral health on the quality of life. OHIP-14 index has been the flag bearer in this regard and is thus used for this study.

OHIP-14 index is used to measure patient's perceptions of the social impact of oral disorders on their general well-being. It provides a comprehensive system of measurement for dimensions related to discomfort, self-reported dysfunction and related disability arising from oral conditions.[12]

According to Lockeret al., OHIP-14 is a patient-centred assessment. It gives a greater weight to behavioural and psychological outcomes and is found to be better at detecting psychosocial impacts among individuals. Hence it also satisfies the main criteria for the measurement of OHRQoL.

The study outcome capturedin above set of tables show cases the percentage distribution of responses across age and gender respectively for the two psychological dimensions for category scale ranging from ''never'' to ''very often'' as captured in the OHIP-14 index. The purpose of this paper was to review the impact of anterior dental trauma on psychological discomfort and psychological disability attributes across various age categories and gender respectively.

Psychological effects dimension based on agecriteria: When this psychological effect dimension was reviewed based on age criteria, it was observed that lowest measured age group of 18-25 had the most

psychological impact at 65.2% with the issue tapering down with age.

The younger age group with little maturity has higher psychological impact than the older more mature groups post 25 years of age. Severity of the issue could be higher among lower age groups, since usually nature of accidents occurs from sports or accidents involving rash driving of youngsters.

Psychological impacts of dental trauma for this age group may be severe so aesthetic considerations should not be neglected. It is found to be one of the important considerations of the age group 18-25. Usually dental conditions are the most severe among health issues in early stages of adulthood, however as one age, other health considerations dominate including life threatening ones. It is quite likely as a result of this, older age groups manage the situation in a better way resulting in reduction of psychological discomfort as compared to younger generation.

Equally important is the fact that younger age group usually is just about starting to become independent financially. Hence this is a in-between phase wherein they are largely still reliant on the family for financial support. As a result may neglect the dental treatment at the appropriate time and the effects become severe later on.

Psychological effects dimension based on gender: Interestingly when the observation is monitored across gender, we observe large discomfort in females in comparison with male gender.

Aesthetic dimension forms akey part for female gender, considerations encompass:

1. Beauty affected hence social impact
2. Societal pressureof friends, family, peers and social media like Facebook, Instagram etc.

It is quite likely this impact would be a lot lower among lower income groups as day to day survival is more important compared to other factors.

There are general attributes which adds to the psychological impact and which usually cuts across gender and ages:

1. Affect by presence of blood and visible nature of the dental trauma.
2. Loss of "hours of schooling/work" with economic consequences. Being able to take time from school/work for these procedures might become cumbersome if the dental clinics are not located at comfortable points.
3. Perception of work peers, friends and family members.

Additionally visit to dental emergency can trigger dental anxiety/fear responses among first time visitors. Hence calming effect of dental surgeon, explanation of the procedures in an easy way and anon-hospital like environment goes a long way in helping the patient settle down and reduce the psychological impact.

The data presented in this study provide a insight into patients' feelings and should be considered essential when evaluating further treatment options. In addition to the prognosis and outcomes, clinicians should consider patients' preferences and perceptions as well as the influence each therapy may have on their quality of life both short-term and long-term.

Health psychologists have recognized that behavioural assets such as resilience, social connectedness and optimism have a direct correlation with an individual's quality of life and howwell one is able to cope with health conditions.[1]

Conclusion

In our study psychological discomfort to anterior teeth trauma was most observed in the age group of 18-25. Interestingly when the observation is monitored across genders, we observe large discomfort in females in comparison with male gender.

The study covered suburban areas of Dakshina Kannada district, further studies need to be carried out for a larger population set. Irrespective of age and gender, psychological impact if not handled appropriately could have a life-long impact and affect the general well-being of the patient.

This study will help to create need based and critical psychological adjunct services which can be incorporated into various community-based projects, with the basic idea of integrating dental health with overall well-being and quality of life of the patient.

Communication and positive reinforcement method is most effective way in reducing the psychological impact and should be considered a valuable investment.

This is aptly highlighted by Andersson in his editorial: "empathy for our trauma patients is the common denominator."It helps to build a trusting relationship and plays a key role in relieving the distress experienced by the patient.

Conflicts of Interest: There are no conflicts of interest.

Source of Funding: Self.

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Effect of Aerobic Exercises on Selected Physiological Variables among College Long Distance Men Athletes

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Abstract

The study aims to evaluate the effect of aerobic exercises on selected physiological variables among college long distance men athletes on systolic blood pressure and diastolic resting heart rate. Thirty (N=30) college men, long distance runners who is selected St. Joseph's Prime Sports Academy Chennai Tamilnadu who have been participating in inter collegiate athletics meet was randomly selected as subjects. The age limit is from of old 18 to 25 years respectively Subjects. Subjects who selected were randomly II team groups each 15. Has been under taken as Group I with aerobic exercises acted as experimental group and Group II acted as the Control group.. The duration of the practice period was restricted to twelve weeks of aerobic practice. The pre-test on the chosen criterion variables was taken prior to the administration of the aerobic exercises and the post-test was taken at the end of the twelfth week. The data obtained from the groups prior to and immediately after the training on the chosen criterion variables were analyzed statistically using the t- test to determine whether the groups differ significantly among the pre and post test means. The confidence level was maintained at 0.05 in all the cases to evaluate the hypothesis. The training effects of aerobic practices evidenced significant influence over the physiological variables of college level long distance men athletes.

Keywords: *Aerobic exercises Physiological variables, Systolic blood pressure, Diastolic resting heart rate.*

Introduction

Training with actual effect depends upon various factors such as training loads, means of recovery, assessment of load and performance capacity, sports equipment, nutrition, psychological characteristics and method adopted for imparting theoretical instruction. Physical Education and Sports is a thirsty area which needs many kinds of training means and method to improve the overall performance of the sportsperson.[1] To improve the sports performance the athlete needs to take part in systematic training by the way of scientific method of training. Actual effect of training depends upon several factors such as training loads, means of recovery, assessment of load and performance capacity, sports equipment, nutrition, psychological characteristics and method adopted for imparting theoretical instruction.[2] Physical Education and Sports is a thirsty area which needs many kinds of training means and method to improve the overall performance of the sportsperson. To improve the sports performance the athlete needs to take part in systematic training by the way of scientific method of training.[3]

Importance of training: An individual is said to be physically fit, when he is completely healthy. At long last, it involves time and inspiration to proceed when the tip top competitor needs to dedicate a few hours per day to preparing. Endurance Training, continuance is the capacity to take part in action for quite a while without exhaustion.[4] Perseverance is produced through all medium and physical organs and frameworks. Continuance is ability to keep up a high caliber of work despite weakness. Every athletic ability and occasions expect continuance to some degree; anyway the vitality prerequisites of amazingly concise aptitudes, for example, a solitary punch are typically met effortlessly.[5] Aerobic exercise at a drawn out and moderate power enhances vigorous limits.

Aerobic Exercises: High-impact importance with oxygen is on focus for healthy body. Indeed, even so the elements of the thought are more convoluted than inferred by the definition. High-impact can be seen as a

mind boggling arrangement of real free market activity. That is the body needs vitality for any sort of action and the need is filled by consuming 10 off the sustenance that eat. Oxygen is the start the fuel needs to consume although heart stimulating exercise is the word as a rule use.[6]

Health benefits: The physiological benefits are highly significant where stable autonomic nervous system equilibrium, with a tendency toward parasympathetic nervous system dominance rather than the usual stress– induced sympathetic nervous system dominance, pulse rate, respiratory rate and blood pressure decrease, cardiovascular efficiency increases, respiratory efficiency increases (respiratory amplitude and smoothness increase, tidal volume increases, vital capacity increases, breath–holding time increases), endurance and energy level increases, weight normalizes, sleep improves, immunity and pain decreases.

Statement of the problem: The research aims to evaluate the effect of aerobic exercises on selected physiological variables among college long distance men athletes on systolic blood pressure and diastolic resting heart rate.

Methodology

This procedures and method applied in the selection of subjects, selection of variables, selection of tests, competency of the tester, reliability of the instruments, reliability, orientation to the subjects, validity of the questionnaires, procedure of scoring, pilot study, practice programmed, collection of data, administration of tests, experimental design and statistical technique were presented. The purpose of this study was to find out the effects of aerobic exercises on selected physical and physiological variables of college long distance of runners. Thirty (N=30) college men, long distance runners who is selected St. Joseph's Prime Sports Academy Chennai Tamilnadu who have been participating in inter collegiate athletics meet was randomly selected as subjects. The age limit is from of old 18 to 25 years respectively Subjects.

Subjects who selected were randomly II team groups each 15. Has been under taken as Group I with aerobic exercises acted as experimental group and Group II acted as the Control group.. The duration of the practice period was restricted to twelve weeks of aerobic practice. A written consent has also been obtained from the subjects. However, they can withdraw their consent in case they felt any discomfort during the period of their participation. These are the dropouts in this study. The same Exercise will be followed, and intensity, is increased week by week, for 6 week, weekly three days Monday, Wednesday, and Friday .Before exercise warm–up 10 Min, after exercise warm down 5 min, subjects were followed.

Statistical Analysis: The above study or project pays attention mainly on the testing between means from two treatment groups and also deals with the increase of means between each group from base line to the post treatment for various measures. The statistical was tool used for those which are the individualized effect that are analyzed aerobic exercises ratio. The pre and post practice performance of the groups is analyzed with 't' ratio the level of significance is 0.05 level of confidence.

Results and Interpretations

Table I: Analysis of t ratio on selected physiological variables

Variables	Scores		Control Group	Experimental Group
DBP	Pre test	Mean	78.07	77.73
		SD	2.53	3.09
	Post test	Mean	75.47	73.80
		SD	3.13	2.99
	t value		2.05	7.34*
SBP	Pre test	Mean	122.30	121.07
		SD	3.61	5.77
	Post test	Mean	116.43	111.17
		SD	3.51	3.92
	t value		2.07	7.76*

Table I indicates that experiment and control group's resting diastolic blood pressure (DBP) Mean and Standard deviation of long distance runners. The experimental group Pre and Posttest mean values are 77.73 and 73.80 and standard deviation values are 3.09 and 2.99 and obtained 't value 7.34* greater 2.0 of 14 also with control group mean value are 78.07 and 75.47 and standard devotion are 2.53 and 3.13. The result of 't' value 2.05 which is lesser than table value 2.05. It showed significant improvement on DBP aerobic training on long distance runners.

Table I indicates that experiment and control group's resting systolic blood pressure (SBP) Mean and Standard deviation of long distance runners. The experimental group pre and Posttest mean values are 121.07 and 111.17 and standard deviation values are 5.77 and 3.92 and obtained 't' value 7.76* which are greater than table value of 2.05 with df of 14 also with control group mean value are 78.07 and 75.47 and standard devotion are 2.53 and 3.13. The result of 't' value 2.07 which is lesser than table value 2.05. The findings of the study indicate that experimental group showed significant improvement on SBP aerobic training on long distance runners. The mean difference pre and posttest on physiological variables are presented in figure-I.

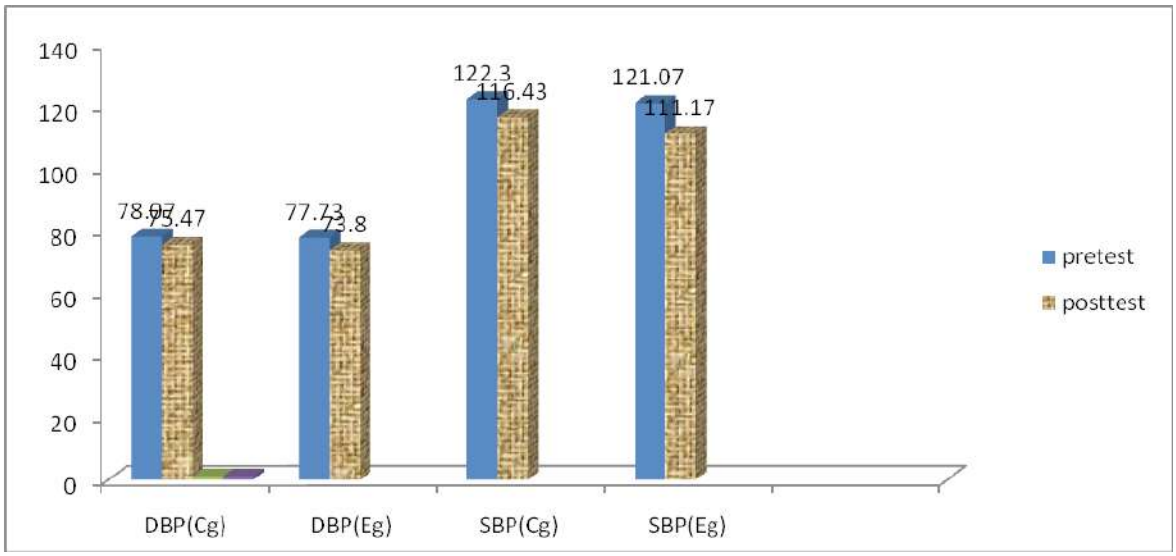

Figure I: Bar diagram shows mean values of pre and post-test of experimental group and control group on physiological variables

Discussion on Findings

The results of SBP shows that the obtained' ratio of experimental group is 7.76 which are greater than required table value of 2.05 with 0.05 level of confidence. It also shows that there was a significant improvement on their SBP of this experimental group. Hence this hypothesis was accepted.

The results of DBP shows that the obtained 't' ratio of experimental group is 7.34 which are greater than required table value of 2.05 with 0.05 level of confidence. It also shows that there was a significant improvement on their DBP of this experimental group. Hence this hypothesis was accepted.

Conclusions

1. There was a significant improvement on systolic blood pressure of the subjects who underwent twelve weeks of aerobic training.
2. There was a significant improvement on diastolic blood pressure of the subjects who underwent twelve weeks of aerobic training.

Ethical Clearance: Nil

Source of Funding: Self

Conflict of Interest: Nil

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A Descriptive Study to Assess the Knowledge on Pre-Menopausal Symptoms among Middle Aged Women in a Selected Village at Kanchipuram District, Tamilnadu, India

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Abstract

A descriptive study to assess the knowledge on pre-menopausal symptoms among middle aged women in a selected village at Kanchipuram district, Tamil Nadu, India. The objectives are to assess the knowledge of premenopausal symptoms among middle aged women in a selected village at Kanchipuram district, Tamil Nadu, India. To find out the association between level of knowledge with demographic variables. The convenience sampling technique was used to select 109 samples. Validity and reliability data collection tools were established. The data were collected by self-administered questionnaires. The collected data were tabulated and analyzed. Descriptive and inferential statistics were used. The study shows that 0% of the women had adequate knowledge, 15% of the women had moderate knowledge, and 94% of the women had inadequate knowledge regarding pre-menopausal symptoms.

Keywords: *Knowledge, Pre-menopausal symptoms, Middle aged women.*

Introduction

Background of the Study:

"Menopause is just puberty's evil older sister"

Menopause is the permanent end of menstruation and fertility defined as occurring 12 months after the last menstrual period. Menopause is natural biological process, not a medical illness. Even so the physical and emotional symptoms of menopause can disrupt your sleep, say your energy and at least indirectly trigger of sadness and loss. Most women being menopause between the ages of 45 and 60. Early menopause usually refers to onset before age 40[1].

Menopause the time when a women stops having menstrual periods, is not a disease or an illness it is a transmission between two phases of a women life. Menopause is the time in a female life when she gets a formal, official signal from her body that she is getting older. This is the time when her menstruation is on the verge of a complete die down. The hot flashes, irritation, mood swings, insomnia, fatigue etc some symptoms of menopause, and there are many more. These symptoms can be unpleasant and tedious to manage[2].

Many women experience a variety of symptoms as a result of the hormonal changes associated with the transition through menopause .around the time of menopause, women often lose bone density and their blood cholesterol levels may worsen, increasing their risk of heart disease[3].

According to National Institute on Aging (2010) usually menopause happens naturally, but some women develop symptoms of menopause and stop having menstrual cycles much earlier than expected. Before age 40, a menopause-like condition can happen for no known reason, or it can be caused by radiation treatment, some medicines like those used in chemotherapy, an autoimmunity (some of a women's own body

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cells attacking herovary or ovaries),or genetic errors. Radiation can make the ovaries stops workings, as can some treatments likechemotherapy for cancer.[4]

Research Methodology

A Quantitative approach with descriptive design was used in the study. The study was conducted among middle aged women at selected village, Kanchipuram District, Tamil Nadu, India. A purposive sampling technique was used to select 149 samples with the following inclusion criteria. Pre-menopausal women who are willing to participate in the study, the women who are under the age group of (45-60)years and who could speak English and Tamil.

Tool for the Study: Self-structured questionnaire used to elicit the demographic variables and to assess the knowledge on pre-menopausal symptoms among middle aged women.

Scoring and Interpretation:

Scoring	Level of Knowledge
Above 75%	Adequate Knowledge
51-75%	Moderated Knowledge
Below 50%	Inadequate Knowledge

Study Findings: The majoriy (36%) of the women were under the age group of 31-40 years, (78.9%) of the women had attained menarche at the age of 11-15 years, (47.7%) of the women have 2 children, (90.8%) of women does not have menstrual irregularity, (51.3%) of women living in nuclear family, (72%) of the women taking mixed diet, (100%) of the women living in the village, (66%) of the women had married at the age of 21-25 years, (43.1%) 0f the women were unemployed, (54%) of the women had monthly income of Rs.5,000-10,000.

The Chi-square association revealed there was no significant association between demographic variables in related with the knowledge aspects of middle aged women with aspects of knowledge on pre-menopausal symptoms. It shows that there is no significant association between knowledge aspects with Age of the women (X^2=2.65), Age at menarche (X^2=7.41), Menstrual irregularity (X^2=1.72), Types of family (X^2=0.33), Dietary pattern (X^2=7.21), Area (X^2=O), Age at marriage (X^2=7.44), Occupation (X^2=10.1), Monthly income (X^2=1.09).There is Significant Association Between No. of . children (X^2=28.67).

Ethical Clearance: Summary, Findings, Discussion, Implication, Limitataion, Recommendation and Conclusion.

The essence of any research project lies in reporting in the findings. This chapter gives a brief account of the present study including conclusion drawn from the findings, recommendations, limitation, suggestion for future studies and nursing implication.

Summary: The study is to assess the knowledge regarding pre-menopausal symptoms among middle aged women in a selected village. This will enhance the middle aged women to improve knowledge regarding pre-menopausal symptoms.

The objectives of the study were: Assess knowledge on Pre-menopausal symptoms among middle aged women.

Associate the knowledge on Pre-menopausal symptoms among middle aged women with selected demographic variables.

The study attempted to examine the following null hypothesis that

H_0: There is no significant association between demographic variables and knowledge on pre-menopausal symptoms among middle aged women in a selected village at Kanchipuram District, Tamil Nadu, India.

The review of literature enabled the investigator to develop methodology of the study literature review was done and organized as studies related to knowledge on pre-menopausal symptoms among middle aged women.

The research approach used was quantitative approach with descriptive design. The main study was done in a selected village at Kanchipuram District, Tamil Nadu India. 109 samples were selected by convenience sampling.

The self-administered questionnaire was used to collect the data regarding demographic variables and the knowledge on pre-menopausal symptoms among middle aged women. The data gathered were analyzed by using descriptive and inferential statistical method. The findings were presented on the basis of objectives of the study.

Findings: Findings of the study were presented under the following headings based on the study objectives

Objective 1: Assess the level of knowledge on pre-menopausal symptoms

The finding of the present study reveals that

0 (0%) had adequate knowledge

15 (13.8%) had moderate knowledge

94(86.2%) had inadequate knowledge

Objective 2: Associate demographic variables with the level of knowledge on pre-menopausal symptoms.

Finding-1: Age and level of knowledge of pre-menopausal symptoms.

There is no significant association between the age and level of knowledge of pre-menopausal symptoms. X^2=2.65, (P<0.05).

Finding-2: Age at menarche and level of knowledge of pre-menopausal symptoms. There is no significant association between the age at menarche and level of knowledge of pre-menopausal symptoms. X^2=7.41, (P<0.05).

Finding-3: Number of children and level of knowledge of pre-menopausal symptoms.

There is significant association between the number of children and level of knowledge of pre-menopausal symptoms. X^2=28.67, (P>0.05).

Finding-4: Menstrual irregularity and level of knowledge of pre-menopausal symptoms.

There is no significant association between the menstrual irregularity and level of knowledge of pre-menopausal symptoms. X^2=1.72, (P<0.05).

Finding-5: Type of family and level of knowledge of pre-menopausal symptoms.

There is no significant association between the type of family and level of knowledge of pre-menopausal symptoms. X^2=0.33, (P<0.05).

Finding-6: Dietary pattern and level of knowledge of pre-menopausal symptoms.

There is no significant association between the dietary pattern and level of knowledge of pre-menopausal symptoms. X^2=7.21, (P<0.05).

Finding-7: Area and level of knowledge of pre-menopausal symptoms.

There is no significant association between the area and level of knowledge of pre-menopausal symptoms. X^2=0, (P<0.05).

Finding-8: Age at marriage and level of knowledge of pre-menopausal symptoms.

There is no significant association between the age at marriage and level of knowledge of pre-menopausal symptoms. X^2=7.44, (P<0.05).

Finding-9: Occupation and level of knowledge of pre-menopausal symptoms.

There is no significant association between the occupation and level of knowledge of pre-menopausal symptoms. X^2=10.1, (P<0.05).

Finding-10: Monthly income and level of knowledge of pre-menopausal symptoms.

There is no significant association between the monthly income and level of knowledge of pre-menopausal symptoms. X^2=1.09, (P<0.05).

Implication: The findings of the study have implication in Nursing services and research.

Nursing Service: Community health nurse conduct educational programs to improve knowledge on pre-menopausal symptoms. In hospital Nurse can provide health education to create knowledge.

Limitation: Middle aged women only included in the study.

Recommendation: This study can be replicated an large sample studies can be conducted in different settings to validate findings

A similar study can be conducted on general public regarding pre-menopausal symptoms.

Conclusion

This study helps the middle aged women to understand about the pre-menopausal symptoms, it becomes necessary to involve the middle aged women as and when during pre-menopausal symptoms and

it can also able to prevent the complications during menopause.

Source of Funding: Self

Conflict of Interest: Nil

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Health Care Services Under Consumer Protection Laws of Union Territories of Jammu and Kashmir: A Socio-Legal Mapping

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Abstract

Ever since the passing of the *Jammu & Kashmir Consumer Protection Act*, 1987, the doctor-patient's relationship came under critical scrutiny, controversy and litigation. The inadequacy of consumer protections laws results in unavoidable contingency, spiralling cost shifting and inordinate health care complexities. It examines health care services as a matter of consumer rights under *Consumer Protection Act,* 1986, *Jammu and Kashmir Consumer Protection Act,* 1987 and *Consumer Protection Act,* 2019. It makes consumers to navigate between hope and despair for access to health care. The paperis driven to analytical study of inadequacy of consumer laws in dealing effectively deficiency of medical service, insufficiency of health care services,lack of medical professionalism and negligence in Sher-i-Kashmir Institute of Medical Sciences (SKIMS), Srinagar by encompassing a legislative survey of consumer laws in inculcating Consumer Right Awareness (CRA) and toning of structural governance of grievance redressal mechanism. The gap between the precept and practice of consumer justice and compensation in health care services is identified for adoption of a robust infrastructural and schematic revamping.

Keywords: *Health Care Services, Consumer Right Awareness, Grievance Redressal Mechanism, Consumer Justice and Compensation.*

Introduction

The health care facilities to the people of the erstwhile state of Jammu and Kashmir (J & K) is marred by constraints of financial resources, difficult topography and terrain, poor road connectivity, low presence of private sector, low accessibility and affordability by under- privileged segments of the population. There has been a gradual decay in the health services of J & K over the last three decades. The state is under shadows of infectious diseases like tuberculosis, RTI, UTI diarrhoea disease.[1] there is growing shadow of chronic diseases like hypertension, coronary artery disease, cancers, and diabetes. Factually speaking there are 3,807 health care institutions in the state which is considered the highest number of hospitals in the country. The annual budget for the health sector in J & K is Rs. 2,423-crore. The per capita spending under plan, non-plan and centrally sponsored schemes is estimated at Rs. 1,931 crore.[2] According to the *State's Economic Survey Report,* 2017,there were 4,433 government health institutions in J & K at the primary, secondary and tertiary levels with 6,674 doctors.[3] The paper examines the efficacy of*J & K Consumer Protection Act,* 1987 to give effect to *Consumer Protection Act,* 1986 to take care of consumer right awareness among patients for robust health care services in two Union Territories of J & K under *Jammu and Kashmir Reorganisation Act,* 2019.

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Materials & Method

The material and method applied for the study include analytical method of legal research by undertaking the legislative survey and scrutiny of consumer laws at central and state levels. These laws

are studied under Parsonian Effecttheory in the context of health care services.[4] The comparative consumer law study of *Consumer Protection Act,* 1986,*J & K Consumer Protection Act,* 1987 and *Consumer Protection Act,* 2019 is based on established canons of statutory interpretation. The material and method partakes an empirical frame work of SKIMS, Srinagar a premier medical institution in J & K state. The case study is based on Consumer Right Awareness (CRA) under four major parameters which include consumer right awareness, redressal against medical negligence, and recourse to deficiency of medical service and compensation and consumer justice.

Findings: It is important to note that the both *Consumer Protection Act,* 1986, *J & K Consumer Protection Act*, 1987 and *Consumer Protection Act,* 2019 are public welfare legislation and has been designed to avoid procedural technicalities, delays, and requirement of court fees to protect consumers availing medical facilities and health care services.[5] It contains three-tier consumer disputes redressal system at the District, State and National levels along with Central Consumer Appellate Authority (CCAA) including right to health and environment.[6]

Central Consumer Protection Act, 1986: The *Consumer Protection Act,* 1986 forms the basis of *J & K Consumer Protection Act,* 1987 therefore a perusal of this law in brief is imperative. The Act seeks to promote and protect the interest of consumers against deficiencies and defects in goods or services.[7] It also seeks to secure the rights of a consumer against unfair trade practices, which may be practiced by manufacturers and traders. The Act applies to all goods and services unless specifically exempted by the Union Government and covers all sectors, whether private, public, or cooperative. It ordains simple, speedy and inexpensive machinery for redressal of consumer's grievances, the marketing of goods and services to consumers, as well as the relationships, transactions and agreements between the consumers and the producers, suppliers, distributors, importers, retailers, service providers and intermediaries of those goods and services.[8] The application of *Consumer Protection Act,* 1986 to health services derives life breath and sustenance from Supreme Court ruling in *Indian Medical Association v. V.P. Shantha.*[9] In this casethe question raised was whether the treatment provided by medical practitioners to their patients would constitute "service" under the meaning of the Act and whether patients would be treated as 'consumers' under the same *Consumer Protection Act*, 1986 The court noted that the issues arising in the complaints against medical negligence can be speedily disposed of by the procedure being followed by consumer disputes redressal agencies. Thus the *Consumer Protection Act,* 1986 is pioneering law in protection of consumer from the standpoint of health, environment and consumer justice.[10]

J & K Consumer Protection Act, 1987: The*J & KConsumer Protection Act,* 1987 aims to provide effective safeguards to the consumers against defective goods, deficient services and unfair trade practices.The Act provides speedy redressal to consumer complainants by setting up of a District Consumer Redressal Forum and State Commission having jurisdictionto claim of Rs. 10 lakhs and Rs. 30 lakhs respectively. The State Commission will be vested with appropriate appellate and revisional powers. It shall apply to all goods and services except those which are specially exempted by notification by the state government did not specifically exempted health care services provided by government hospitals. It seems profitable to refer section 2(1) (0) as under:

"Service" means service of any description which is made available to potential users and includes the provision of facilities in connection with banking, financing, insurance, transport, processing, supply of electrical or other energy, board or lodging or both, entertainment, amusement or the purveying news or other information, under a contract of personal service.

The necessary penal and punitive provisions have been incorporated for effective redressal of unfair trade practices, defect in the goods, and deficiency of services. The Consumer Commissions are authorized to impose penalties on trader or person against whom complaint is made if he fails to comply with the order of the redressal agency.

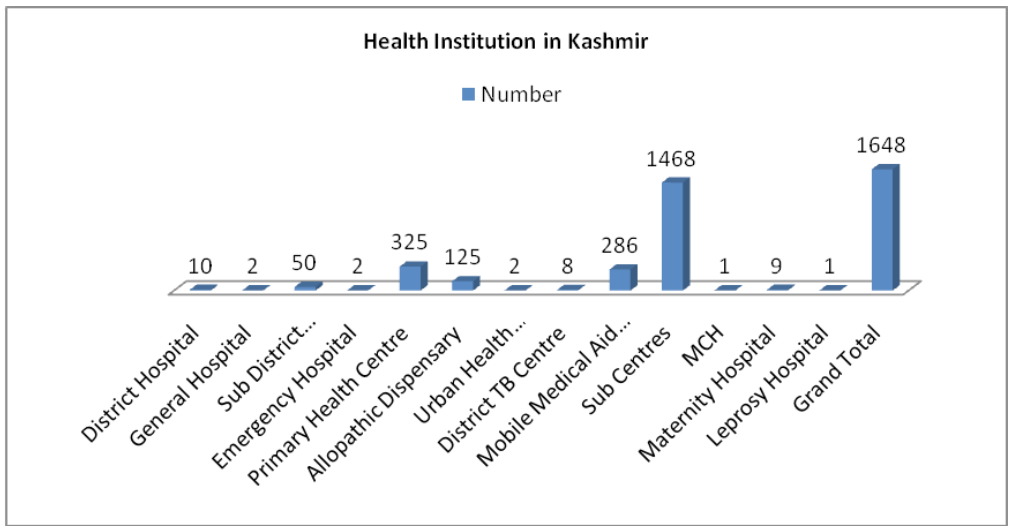
J & K Government Doctors (Relaxation of Restrictions on Private Practice) Rules, 1987: It will be appropriate to see the application of *J & K Consumer Protection Act,* 1987 and *J & K Government Doctors (Relaxation of Restrictions on Private Practice) Rules,* 1987 in holistic perspective in regard to doctor patient relationship and health care services. This is also important to see this law in the context of penalty or punishment may involve imprisonment for a period not more than 3 years or a fine or both. The complaint mechanism by a consumer voluntary organization, registered society, company and state government will

also be scrutinised in pragmatic discourse. Therefore, it is also worthwhile to inquire the synergy of both legislations from the lens of the executive and judicial attitude towards disciplining doctors and foster health care services to patient *vis-a-vis* banning private practice. The J & K High Court in *Dr. Ashutosh Gupta v.State of J & K,* [11]while hearing petition for quashing of Government Order No. 43/HME of 2013 dated 17.01.2013 regarding of banning of private practice by doctors of government medical college, associated hospitals and dental colleges upheld the impugned order of the Government. In *Sukesh Chander Khajuriav. State of J & K,*[12] the J & K High Court dismissed the writ petition regarding validity of *J & K Government Doctors (Relaxation of Restrictions on Private Practice) Rules,* 1987.

Discussions

The study of health care services under consumer protection laws of J & K health institutions is an empirical study of SKIMS with 900 bedded tertiary care hospital and undergraduate medical college with intake capacity of 100 students. According to survey there are total 1648 health institutions in J & KState.[13]

Selection of Area of Study: SKIMS being premier medical institution in India, it provides additional services including prevention, treatment, rehabilitation, obstetrics, substance abuse, health education, and screening for cancers and other diseases.[14]



The case study of SKIMS is based on four major parameters *viz;* consumer right awareness, [15]redressal against medical negligence, recourse to deficiency of medical service and compensation and consumer justice under the *J & KConsumer Protection Act*, 1987 and *J & K Government Doctors (Relaxation of Restrictions on Private Practice) Rules*, 1987. Located in Soura area of Srinagar, this is the largest medical Institute under *Sher-i-Kashmir Institute of Medical Sciences, (Grant of Degrees) Act,* 1983.[16] The *J & K Consumer Protection Act,* 1987 is not applicable to government hospitals because of free medical care services to patients. But the medical services rendered by doctors and hospitals falls within the ambit of a "service" as defined in Section 2(1) (o) of the Act.

Consumer Right Awareness & Health Care Services: By this analogy persons who are rendered free service are "beneficiaries" and as such come within the definition of "consumer" under Section 2(1) (d) of the Act. Similarly the deficiency of service is spelt out under Section 2(1) (g) which covers diagnostic, surgical and therapeutic service.[17] A sample survey of 100 patients admitted to SKIMS was conducted regarding consumer right awareness to healthcare.[18] The following table and chart-1 shows the nature and depth of consumer right awareness among randomised number of patients is in and out patient department. The simple question regarding the legal literacy of consumer law and redressal agencies were put to these patients.

Table 1: CRA & Health Care Services

Patients	Respondents	Yes	%age	No	%age	Indifferent	%age
In Patients	50	10	20	35	70	05	10
Out Patients	50	12	24	34	68	04	08
Total	**100**	**22**	**88**	**79**	**79**	**09**	**09**

Source: Field work

The above table clearly shows that 22% respondents have knowledge about consumer law or redressal agencies while as 79% respondents said that no they were not having any knowledge about consumer laws however 9% respondent didn't said anything about the information of consumer laws. The legal literacy about the complaint mechanism for the deficiency in medical services is also in abysmally low. When we asked patients about the deficiency of medical services gives rise to grievance redressal at appropriate consumer forum almost 2/3 respondents feign ignorance about it.

Table II: CPA & Grievance Redressal Mechanism

Patients	Respondents	Yes	%age	No	%age	Indifferent	%age
In Patients	50	10	20	35	70	05	10
Out Patients	50	11	22	34	68	05	10
Total	**100**	**21**	**21**	**69**	**69**	**10**	**10**

Source: Field Work

The medical negligence on as the part of health care provider is frequent in J & K that is why the patient affected by medical negligence have faint idea about the complaint mechanism as victims. The Table II shows that 21% respondents have knowledge about complaints in consumer forums on the basis of data received from respondents 69% respondents said that they were not aware about the concept of complaints in consumer forums, however 10% respondents didn't say anything about the complaints in consumer forums.

Table III: CPA & Medical Negligence

Patients	Respondents	Yes	%age	No	%age	Indifferent	%age
In Patients	50	10	20	34	68	06	12
Out Patients	50	13	26	32	64	05	10
Total	**100**	**23**	**23**	**66**	**66**	**11**	**11**

Source: Field Work

The Comptroller and Auditor General (CAG) of India has reported that 'even the emergency medicine department has been found to be not fully equipped to deal with cases of road traffic accidents having multiple organ injuries including orthopedic injuries.' This is also pathetic to note that ambulances meant for patients have been found mis-utilized to the extent of 40 to 47 per cent during 2008-12.[19]

Health Care & Medical Negligence: The knowledge regarding negligence in health care services reveals that 23% respondents were aware about the complaints mechanism. The ordinary prudence about medical negligence depicts that 66% respondents don't have knowledge about grievance redressal and 11%remain indifferent to liability of doctors and hospital authorities.

Table IV: Health Care Services & Medical Negligence

Patients	Respondents	Yes	%age	No	%age	Indifferent	%age
In Patients	50	11	22	36	72	03	06
Out Patients	50	10	20	35	70	05	10
Total	100	21	21	71	71	08	08

Source: Field Work

Compensation & Consumer Justice: the compensation incase of medical negligence to the patients and their kith and kin also represent empathtic and ignorance. The patient interviewed regarding their response to compensation in case of medical negligence reveals that 21% respondents show that they have knowledge about penal provisions against doctors.[20] Still majority of patients to the tune of 71% said that they were not having any information related penal provisions where as 8% are either ignorant or indifferent didn't say anything about penal action can be initiated in case of medical negligence on part of hospital and doctor.

Table V: Compensation & Consumer Justice

Patients	Respondents	Yes	%age	No	%age	Indifferent	%age
In Patients	50	08	16	38	76	04	08
Out Patients	50	09	18	36	72	05	10
Total	100	17	17	74	74	09	09

Source: Field Work

The apex court ruling has played seminal role in curbing medical malpractice and making compensation an integral part of consumer justice that 17% respondents have knowledge about compensation given by consumer forums and 74% said that they were not having any information related compensation related consumer forums however 09% respondents didn't say anything about compensation provided by consumer courts. This places the consumer justice in a conundrum especially in the aftermath of Supreme Court decision.

Conclusion

The analysis of health care services under consumer laws of erstwhile J & K state now Union Territories of J & K under *Jammu and Kashmir Reorganisation Act,* 2019 reveals that health status of the people has not been able to keep pace with the national targets. The state has a considerable segment of population living below poverty line, inadequacy of healthcare and burden of disease in an environmentally benign setting.[20] The *J & KConsumer Protection Act,* 1987 has not achieved consumer right awareness and assertiveness in realisation health care services. The health services and disease overburden needs proper regulation. This becomes more important in the wake of unrest of decades has worsened the health status of people especially of population living below poverty line. The only salacious aspect is to note that the purpose and object with which the *J & K Consumer Protection Act,* 1987 has been passed has substantially achieved in the ambit of patient's rights notably compensatory justice. But the SKIMS have been found inadequately equipped to deal with accidents and trauma prevention and gross mis-utilisation of ambulance services despite rich infrastructure. The most significant and equally multifaceted as well complex service in the field of consumer grievances is that of medical malpractice and the doctors of SKIMS and other government hospitals of state need to be more circumspect and careful towards medical services to patients to enlarge the realm of consumer justice, access to health and compensatory jurisprudence.

Conflict of Interest: No

Source of Funding: self

Ethical Clearance: No

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Comparison of Morphological Features of Second Cervical Vertebra between Genders Using Computed Tomography

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Abstract

Introduction: Gender determination has been the emphasis of many forensic studies and have significance in mass fatality cases where bodies are damaged beyond recognition, as these factors are essential and various method are developed that allows gender determination. Second Cervical vertebra due to its ample degree of sexual dimorphism in its dimension allows sex determination. Forensic investigators can identify the bone by its morphological characteristics, such as the dens, short spinous process and cervical vertebra is known to be the best preserved of all the vertebra in cadavers.

Aim: To compare the morphological features of second cervical vertebra between genders using Computed Tomography.

Materials and Method: This was a retrospective study which included subjects visiting for CT (Computerized Tomography) of cervical spine in Department of Radio-diagnosis and Imaging, Kasturba Medical College, Manipal, Karnataka, India. Sample size was calculated using the formula for estimation of population mean which gave a total sample of 160. A total of 160 patients underwent computed tomography of cervical spine on MDCT Brilliance 64 slice Philips with routine protocol and later post-processed into Multiplanar imaging. In present study nine measurements of the second cervical vertebra were taken. Anthropometric measurements were performed which was calculated using the measurement tools. The data was analyzed using SPSS (V.20.0).

Results: Discriminant function analysis was performed to calculate the mean and standard deviation. Standardized canonical discriminant function was performed to find out the variable dependency and was found that maximum distance measured from the most lateral edges of the superior articular facets (DMFS) contributed much of the separation between genders. Step wise discriminant function test was performed to predict the categorical dependent variable a multivariable model was generated which showed that maximum distance measured from the most lateral edges of the superior articular facets (DMFS) and Maximum sagittal length (AS) reached the accuracy of 77.5% in gender discrimination. The most discriminant variable for the C2 was DMFS followed by AS, with expected accuracies of 73.8% and 71.9%. Among nine variables seven variables (AS, LMA, DMFS, DSD, DTD, WVF and DTMC) showed correct prediction rates approximately 78.8% and two variables (DA, DSMC) yielded no result.

Conclusion: DMFS contributed much separation with high accuracy in comparison to others, affirming that there is considerable sexual dimorphism with respect to the second cervical vertebra which could determine the gender of human based on CT measurements of second cervical vertebra.

Keywords: *Anthropometry, Cervical spine, Gender determination, Sexual dimorphism.*

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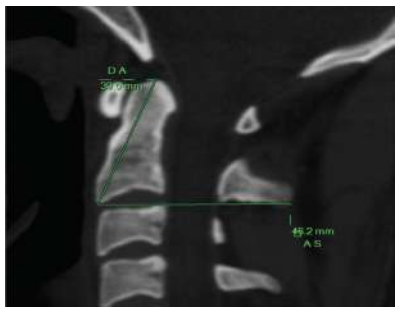
Introduction

Gender determination has been the emphasis of many forensic studies and have significance in mass fatality cases where bodies are damaged beyond recognition, as these factors are essential and various method are developed that allows gender determination[1-3].

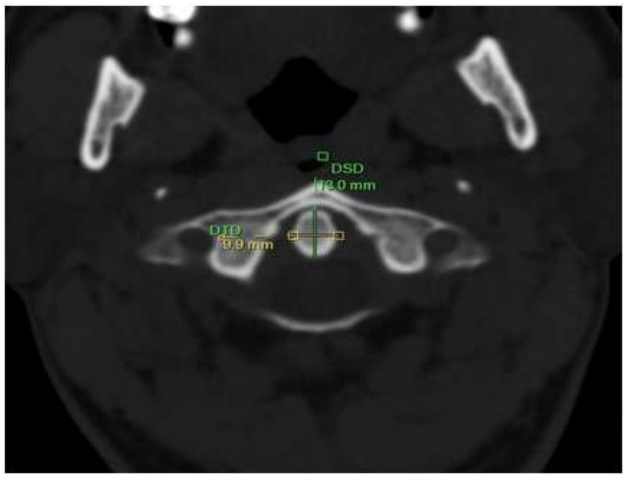
DNA technologies are rational, narrowed down due to the accessibility of forensic legal laboratories and the cost effectiveness. For gender determination the most reliable parts are skull and pelvis which exhibits sexual dimorphism [2,4]. However, some human skeletal parts are found to be damaged due to decomposition and carnivore modification, other parts that are less dimorphic such as tibia, humerus, hyoid bone, foramen magnum should be considered for gender determination, and thus new techniques that deal with such parts should be considered. Second cervical vertebra due to its ample degree of sexual dimorphism in its dimension allows sex determination. Forensic investigators can identify the bone by its morphological characteristics, such as the dens, short spinous process and cervical vertebra is known to be the best preserved of all the vertebra in cadavers [3,5]. Therefore, the aim of the present study was to assess the sexual dimorphism from the 12th thoracic and the first lumbar vertebra measurements and data was obtained from reformatted images of multi-slice computed tomography (MSCT).

Materials and Method

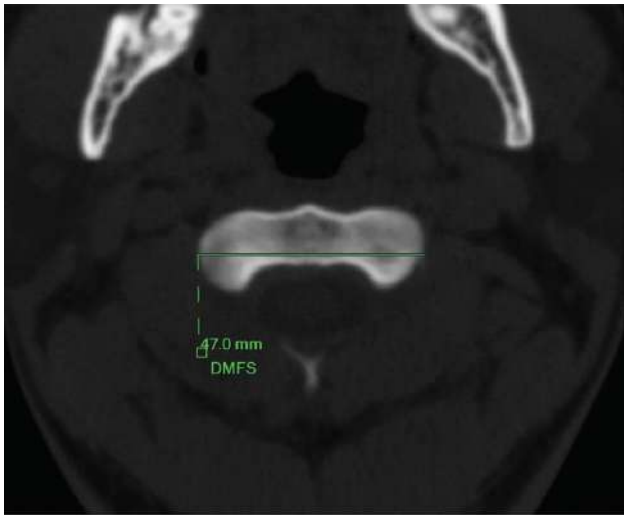
A retrospective observational study was carried out at Department of Radio-Diagnosis and Imaging, Kasturba Hospital, Manipal, Karnataka, India, using Phillips Brilliance 64-SLICE CT. Approval was acquired from institution research committee, School of Allied Health Sciences and ethical committee, Kasturba hospital. Sample size was calculated using the formula for estimation of population mean which gave a total sample of 160. Data from 160 samples (80 males and 80 females) were obtained, who were referred to the Radio-diagnosis department by the treating physician for CT cervical spine over the period of 12 months. Patients with trauma, major injuries and fractures of cervical spine were excluded from the study. CT of cervical spine was performed with patients positioned on the CT couch in supine head first position, with area coverage from tip of mastoidto sternal notch. Scan of the required area of interest was performed on acquired scanogram keeping in mind that the scan is performed with no loss of anatomical structure, axial sections of cervical spine was obtained with 0.9 mm slice thickness and slice increment of 0.45 mm with detail D filter producing standard bone resolution images. Informed consent was obtained from the patient before the start of examination. The original series of cervical spine with slice thickness of 0.9 mm and slice interval of 0.45 mm were selected for the study, Axial images per patient data set which were included in the study were sent to Phillips Extended Brilliance workstation and the acquired axial sections were reformatted into coronal and sagittal sections using MPR (Multi-Planar Reconstruction) technique [6]. Anthropometric measurements were performed on the following section; the maximum length of the parameter was measured on axial and sagittal sections. The Maximum height of the Dens (DA) and Maximum sagittal length (AS) was measured from the sagittal section where tilts can be checked. The axial and coronal planes were used to correct the image to get the orientation of the second cervical vertebra. The other measurements were taken from the axial sections which were checked for tilts and corrected using sagittal and coronal images to acquire the center of the second cervical vertebra. Maximum height of dens (DA) is defined as length from the superior point on the dens to the anterior-inferior point on the vertebral body and Maximum sagittal length (AS) i.e., Length from the anterior-inferior point on the vertebral body to the posterior point on spinous process [Fig-1]. Dens Sagittal Diameter (DSD), (Maximum sagittal diameter measured between the anterior and posterior points on dens). Dens Transverse Diameter (DTD), (Maximum transverse diameter of dens measured between most lateral edges of the dens) [Fig-2]. (Maximum distance measured from the most lateral edges of the superior articular facets) (DMFS) [Fig-3]. Maximum width of the axis (LMA) shown in [Fig-4], Width of Vertebral Foramen (WVF) (Maximum internal width of the vertebral foramen) [Fig-5]. Maximum sagittal diameter of the body (DSMC) (The maximum sagittal diameter of the body measured from the anterior-inferior point on the board to posterior-inferior point). Maximum transverse diameter of the body (DTMC). (The maximum transverse diameter of the body measured between the most lateral edges of the body) [Fig-6], were measured using the measurement tools provided by the Phillips extended brilliance work station.



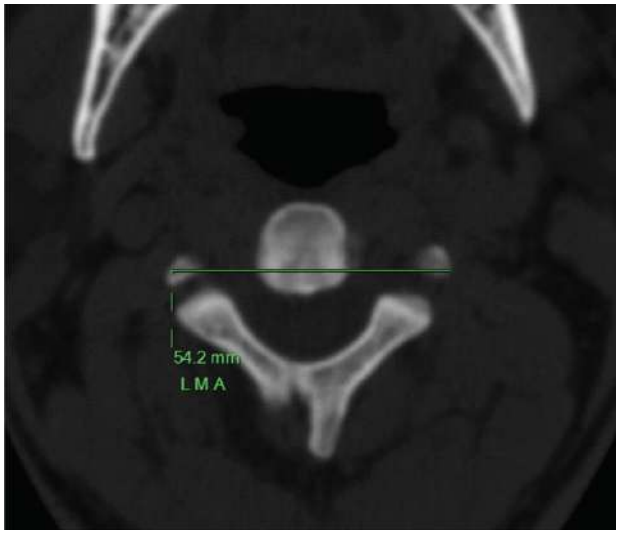
[Fig-1]: Figure showing maximum height of the dens (DA) and maximum sagittal length (AS).



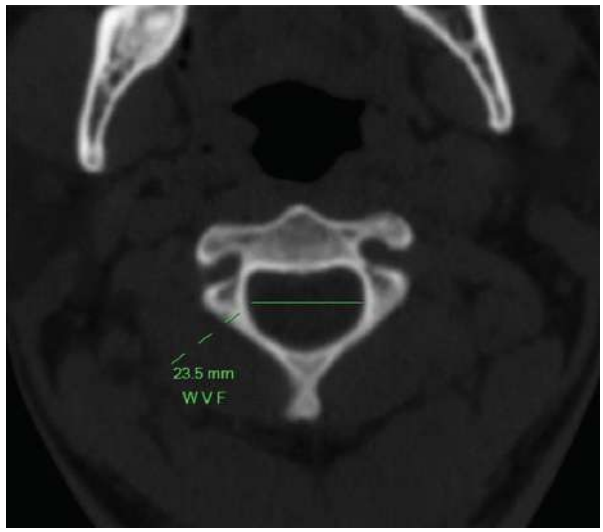
[Fig-2]: Figure showing Dens Sagittal Diameter (DSD) and Dens Transverse Diameter (DTD).



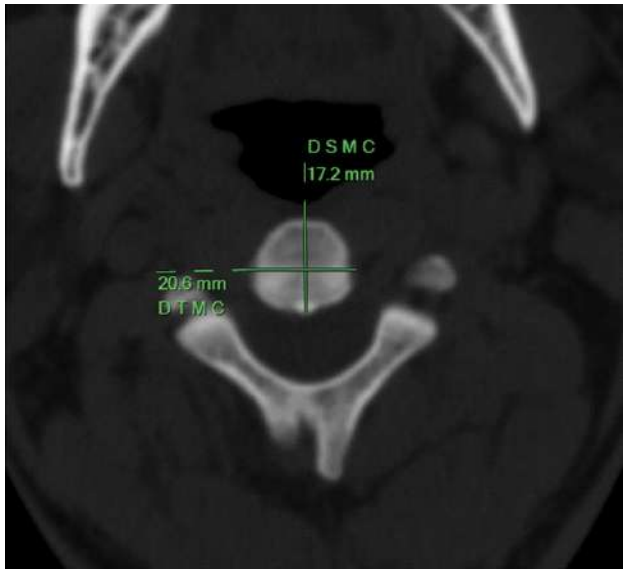
[Fig-3]: Figure showing maximum distance between superior facets (DMFS).



[Fig-4]: Figure showing maximum width of the axis (LMA).



[Fig-5]: Figure showing Width of Vertebral Foramen (WVF).



[Fig-6]: Figure showing maximum sagittal diameter of the body (DSMC) and maximum transverse diameter of the body (DTMC).

Statistical Analysis: The metric data obtained were analyzed by using SPSS Version 20.0 and statistical difference in the cervical vertebra measurements of males and females were assessed using discriminant function analysis to predict the categorical dependent variable and to compare the canonical discriminant function coefficients to recognize which independent variable was more segregating than alternate variables. Discriminant function analysis test was used to evaluate the mean and standard deviation for the anthropometric parameters of both male and female. Standardized and unstandardized canonical discriminant function was determined to assess the variable dependency.

Results

The Mean and standard deviation of both sexes for all the nine variables are reported using descriptive statistics as shown in [Table-1].

[Table 1]: Descriptive statistics for the nine variables are reported which shows mean and standard deviation of both sexes.

Variable	Sex	Mean	Standard Deviation
DA	Male (80)	85.18	421.27
	Female (80)	82.33	421.48
AS	Male (80)	46.35	5.009
	Female (80)	43.18	2.727
LMA	Male (80)	54.54	5.202
	Female (80)	54.83	44.98
DMFS	Male (80)	45.33	2.515
	Female (80)	42.05	2.267
DSD	Male (80)	12.39	10.703
	Female (80)	10.17	1.248
DTD	Male (80)	9.841	1.092
	Female (80)	9.616	3.629
WVF	Male (80)	22.77	1.567
	Female (80)	21.95	1.364
DSMC	Male (80)	17.02	1.399
	Female (80)	32.88	159.2
DTMC	Male (80)	21.24	2.630
	Female (80)	19.81	2.450

[Table-2]: Canonical discriminant function coefficients.

	Function 1
DA	.000
AS	.082
LMA	-.002
DMFS	.321
DSD	.024
DTD	-.044
WVF	.125
DSMC	.000
DTMC	.034
(Constant)	-20.946

Discriminant function analysis was used to predict a categorical dependent variable (called a grouping variable) by one or more continuous or binary independent variables (called predictor variables). On comparing canonical discriminant function coefficients, it was conceivable to recognize that DMFS showed much differentiation followed by WVF, AS, DTMC, DSD, DTD and LMA as shown in [Table/Fig-8].

The most discriminant variable for the C2 is DMFS followed by AS, with expected accuracies of 73.8% and 71.9%. Among nine variables seven variables (AS, LMA, DMFS, DSD, DTD, WVF andDTMC) showed correct prediction rates approximately 78.8% and two variables (DA, DSMC) yielded no result. The equation for sex estimation using the seven variables is as follows:

Z=-020.946+0.082 (AS)+(-0.002) (LMA)+0.321 (DMFS)+0.024 (DSD)+ (-0.044) (DTD)+0.125 (WVF)+0.034 (DTMC). The values ranging from -0.758 to 0 is assigned as Female and 0 to 0.758 is assigned as Male.

Stepwise discriminant function analysis was performed which resulted in multivariable model. Two variable models reached the accuracy of 77.5%. The equation for gender estimation using two variables is as follows.

Z=-19.453+0.082 (AS)+**0.361** (DMFS) The values ranging from -0.723 to 0 is assigned as Female and 0 to 0.723 is assigned as Male as shown in [Table/Fig-9].

[Table-3]: Stepwise discriminant function analysis.

Variable	Unstandardized Coefficient	Group Centroids		Prediction Accuracy	
		Male	Female	Male	Female
AS Constant	0.082 -19.453	0.723	-0.723	76.3	23.8
DMFS Constant	0.361 -19.453	0.723	-0.723	21.3	78.8

Discussion

In present study 160 patients (80 males and 80 females) were included who were referred for the CT scans of the neck and cervical spine where the C2 vertebra is seen, in which the measurements can be taken.

In the present study the overall mean value of the males is larger than the females; this shows the existence of sexual dimorphism. Torimitsu S et al., conducted a study on sexual determination based on multidetector computed tomographic measurements of the second cervical vertebra in a contemporary Japanese population. Multiple DFA with stepwise variable selection resulted in multi variable models a five-variable model reached an accuracy rate of 92.9% [5]. In the present study, descriptive statistics for nine variables were included and all the nine variables demonstrated significant sexual dimorphism. In the present study, descriptive statistics for nine variables were included where only seven variables (AS, LMA, DMFS, DSD, DTD, WVF, and DTMC) demonstrated significant sexual dimorphism and two variables (DA, DSMC) yielded no result. Stepwise variable selection resulted in a multivariable model a two variable model reached an accuracy rate of 77.5%. Torimitsu S et al., reported in his study the most discriminant variable for the C2 was DMFS followed by LMA with an accuracy of 83.5% and 83.1% respectively [5]. In the present study, the most discriminant variable for the C2 is DMFS followed by AS with an accuracy of 73.8% and 71.9% respectively.

Gama I et al., performed a study in documented Portuguese skeletal sample at University of Coimbra. In present study, investigator performed t-test analysis to identify differences among sexes and found that out of 13 dimensions one measurement was not showing significant differences and reported that LMA-followed by DSMC are the most dimorphic dimensions of the second vertebra with the level of dimorphism of 11.18% and 10.6% respectively [7]. In the present study the most discriminant variable for the C2 is DMFS followed by AS with an accuracy of 73.8% and 71.9% respectively. Gama I et al., performed logistic regression analysis with stepwise variable selection to develop a model and reported a multivariate model with four variables reached an accuracy of 89.7% as shown in [Table/Fig-10] [5,7].

[Table-4]: Table showing previous studies percentage accuracy.

Study	No of Patients	Result Accuracy
Sugur Torimitsu, et al	224(112 males & 112 females)	92.9%.
Ines Gama, et al	1st Sample 190(99 males & 91 females) 2nd Sample 47(24 males & 23 females)	89.7%
Current study	160(80 males & 80 females)	78.8%

Stepwise variable selection resulted in a multivariable model a two variable model reached an accuracy rate of 77.5%. In the present study DMFS showed significant variability among males and females which suggests that measurements of DMFS can be obtained and used to differentiate between the genders.

Limitations: The study has certain limitations such as all the parameters measured did not show significant values and were not efficient discriminators among the gender group. Further studies can be carried out using larger sample size which may lead to better accuracy and reveal a stronger conclusion**.**

Conclusion

In the present study nine measurements of the second cervical vertebra were taken out of which seven variables were good discriminators where DMFS contributed much separation with high accuracy in comparison to others. The results allow affirmation that there is considerable sexual dimorphism with respect to the second cervical vertebra which could determine the gender of human based on computed tomographic measurements of second cervical vertebra.

Conflict of Interest: Nil

Funding: Nil

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Acceptance of PBL by Students to Learn Pre-Clinical Sciences

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Abstract

Introduction: Medical education needs to be changed both in content and in teaching methodology . The students need to be prepared with high level of knowledge, analytical skills, critical thinking, self-directed learning and group dynamism. Problem Based Learning (PBL) can be used as a tool for teaching undergraduate students. PBL is not problem solving but problem analysing. Here the students need to analyse the problem after they have been taught in the conventional method.

Objectives: Find The attitude of students towards PBL.

Methodology: After a year of PBL practise, a twenty two set feedback questionnaire based on Elizondo–Montemayor with 5 point Likert scale was taken from 98 students with 1 as least acceptable to PBL, 5 as most acceptable and 3 as ambivalent response. The data was analysed by using one sample Wilcoxon's test for two- tailed hypothesis.

Results: Search phase and preparation phase had a median score greater than 3, indicating a positive attitude for these phases. Presentation phase showed ambivalent response towards PBL objectives. Overall response had a mean location above 3 suggesting students acceptance towards the objectives of PBL.

Conclusion: The future PBL sessions can be modified, planned accordingly and executed in a more productive way so as to nurture the development of reflective learning in students to bring maximum improvement in the educational outcome. To have better educational outcome, PBL must be used as an adjunct along with the traditional method.

Keywords: *Problem Based Learning, Self directed learning, medical students, attitude, brain storming.*

Introduction

Medical teaching is undergoing radical changes. In India the curriculum has not been revised since 30 years. The most challenging is to design a curriculum that delivers an optimum level of required knowledge, skills, critical thinking and self- directed learning that would prepare students for professional practice[1]. Currently, the teaching and assessment are not aligned . Students are evaluated on the basis of declarative knowledge. So the curriculum needs to be revised and changed. One of the changes is to introduce PBL to the UG students.

PBL is in alignment of professional practice and learning . This would provide functioning knowledge that can be put to work immediately on graduates or in real life works. This will improve relevance and motivation for learning. PBL is not problem solving but problem analyzing . Here, a medical problem is presented to a small group of students for discussion under the guidance of a facilitator . The students have to analyze the problem after they have been taught in the conventional method. The problems are constructed in a way that the goals of PBL areachieved.

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- Activates students constraint knowledge that can be put to work.
- Integrate and apply new knowledge to solve the problem.
- Increases self directed learning, self management skills, attitude, knowledge and develops professional wisdom.
- Enhances and optimises the educational outcomes.
- Develops and motivates group skills[2].

Material and Method

We have introduced integrated PBL in Apollo Institute of Medical Sciences & Research (AIMSR), Hyderabad, Telangana to the 1st year students of 2017-18 batch from September 2017 to April 2018. Horizontal integration of the 1st year subjects was done. Twelve problems have been constructed on real life situations on the topics which were covered in the first three semesters.

- Hematology - Erythroblastosisfoetalis
- Gastro Intestinal Tract - Obstructivejaundice
- Cardio vascular system -Hypertension
- Cardio vascular system - Myocardial infarction
- Respiratory system–Chronic Obstructive Pulmonary Disease
- Renal system - Acute Renal Failure
- Endocrine system - Pituitaryadenoma
- Endocrine system -Hyperthyroidism
- Endocrine system - Diabetes mellitus
- Reproductive system - Poly cystic ovarian disease
- Reproductive system - Infertility
- Central Nervous System -Hemiplegia

100 students were divided into five groups of twenty students each guided by a facilitator. The faculty of pre clinical departments constructed the problem with prior discussions . Care was taken in constructing the problems, so that it covered all the objectives pertaining to the subjects of Anatomy, Physiology and Biochemistry which were expected to be learnt by the 1st year MBBS students. The structured problem promoted discussions, activated and incorporated knowledge, required new knowledge that students did not know, stimulated active participation and required self directed learning for meeting the learning outcomes.

Guidelines Followed for Constructing a Problem:

- Title–Given in a way to guide the students in a particular direction.
- Trigger material –A story or a description of phenomena orevents.
- Size - Short as meant only for the 1stYear MBBS students.
- Number of Issues- Direct learning into a limited number of issues.
- Distractions - Less distractors.
- Style - The structured problem was constructed in a way that indicated gaps in what the students already knew.

Each topic of PBL consisted of two sessions with one weeks gap between the two sessions. Each session was for two hours .

The first session is called as the brain storming session where the students attend the session with a note book and a medical dictionary to search for unfamiliar terms. A leader and a scribe was selected by the students in this session . The job of the leader was to see that each student participated actively in the group discussions. The scribe made notes of all the important points that were discussed. After going through the problem, the students analyzed the problem and came to ahypothesis.

Then the students came with the learning objectives pertaining to the problem. As the group comprised of twenty students, so twenty objectives were made and numbered accordingly. The role of the facilitator in this session was passive. The facilitator guided the students if the discussions went out of track and facilitated them till the students came with all the twenty objectives correctly. The names of reference text books, research articles and website links related to the problem were given by the facilitator during this session. At the end of this session, the facilitator gave the feedback to the students based on their participation in the group discussion.

Activity in 1st Session:

- Presentation of the problem
- Analysis of the problem - review the facts of the problem.

- Generation of Hypothesis–explain various aspects of the problem.
- Formulate learning objectives–to identify the content that needs to be learnt in depth.
- Identify the proper learning resources - (e.g. textbooks, internet, etc)–from where to search and gather information regarding the problem.
- Assign tasks to group members - to search for information related to the topic.

In the week to follow, all the group members have to learn all the objectives that were framed in the first session. They could either do group study or study alone according to their convenience by taking the help of the references that was provided by the facilitator. For any doubts, the students could meet the facilitator or any faculty of the concerned department.

Activity in 2nd Session: At the end of the 1st week, the same group of students and the facilitator met at the same time and same place for the second session which is called as the presentation session. In this session, all the students of the group came prepared with all the twenty objectives that they made in the brain storming session. The scribe made twenty lots numbered from 1 to 20 according to the number given for each objective . Each student had to pick one lot so that everyone got one objective. After this, each student presented the objective according to the number mentioned in the lot picked by them. In this session too, the role of the facilitator was passive. The facilitator only gave them any additional knowledge that the students might have missed and clarified if any doubts arose regarding any of the objectives or the problem . The session ended with a summary presented by the leader.

- Share - the gathered knowledge and information among the group members
- Re-analyze - the problem.
- Refine and reformulate - the hypotheses.
- Integrate and apply - the refined hypotheses to explain the issues related to the problem.
- Resolve and summarize - the problem

Institutional research committee permission was taken to undertake a cross sectional study on 1st year MBBS students of 2017 batch in the Department of Physiology, AIMSR. At the end of 3rd semester, a feedback questionnaire was given to the students to find out what factors were enhanced or inhibited in the learning process through the PBL methodology. The questionnaire consisted of a set of twenty two questions with five point Likert scale scoring based on the modified version of standard questionnaire developed by Elizondo–Montemayor[3] . The questionnaire set was prepared for three phases of PBL. Search phase with eight questions, preparation phase with six questions and presentation phase with eight questions.

The students were assembled and after briefing them and taking consent, the questionnaire was distributed. The students were given 20 minutes to complete the questionnaire. They were asked to indicate their degree of agreement for each statement with a tick according to: 1 = strongly disagree, 2 = disagree, 3 = moderate, 4 = agree, 5 = strongly agree. Care was taken to ensure that they do not discuss among themselves. Confidentiality and anonymity was maintained .

Statistical Analysis:

- For every individual, median score was calculated from the Likert scaledata.

- A score of 1 was interpreted as being least acceptable and 5 as most acceptable

- One sample Wilcoxon's test was used to statistically analyze the score for two- tailed hypothesis.
  - Median score of 3 for an individual was assumed to represent ambivalent or uncertain acceptance of PBL.
  - Median score greater than 3 was taken to represent definitive positive acceptance.
  - Median score less than 3 implied that PBL was less acceptable as a learning method.
    - Null hypothesis : median score=3
    - Alternate hypothesis : median score ≠3
- $\alpha = 0.05$ was used as the criterion for statistical significance.

Results

Totally 98 students of MBBS 1st year of 2017 batch participated in the study. The median on the overall score for twenty two questions of the questionnaire was less than 3 for 16 students . For 41 students the median was equal to 3 and for the remaining 41 students the median was greater than 3. One sample Wilcoxon's test for overall score indicated that the true location for median

score was above 3 suggesting students acceptance and adherence of overall PBL objectives (p=0.005919). Figure 1.

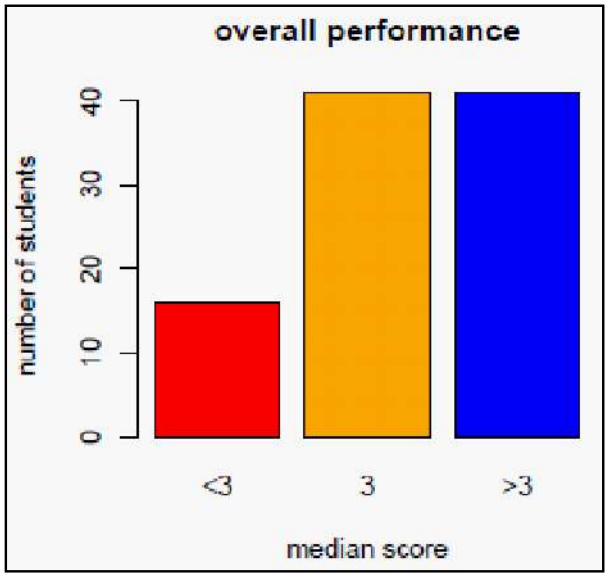

Figure 1

In the search phase, 54 students had a median score greater than 3(p<0.001). 24 students with a median score equal to 3 and 20 students with a score less than 3, indicating a liking for this phase of PBL. Figure 2.

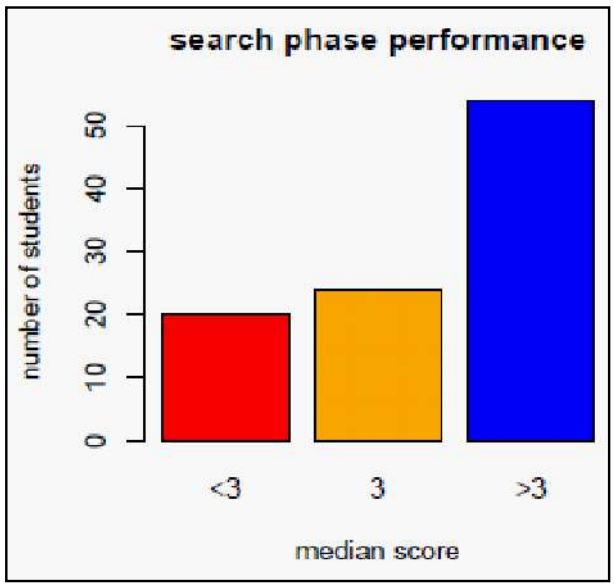

Figure 2

Even the preparation phase indicated a positive attitude of the students towards this phase of PBL with a median score greater than 3(p<0.001) for 62 students. Where else 21 students had a median score equal to 3 and remaining 15 students had a median score less than3. Figure 3.

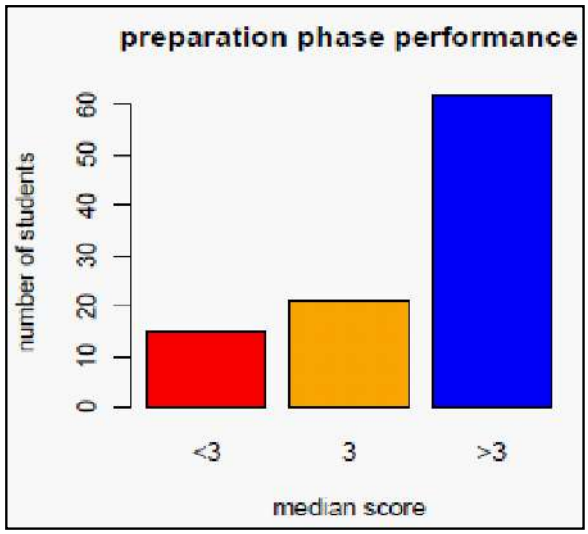

Figure 3

The presentation phase suggested their ambivalent influence on the PBL objectives for this phase with a median score less than 3 for 28 students as well as equal number of students having a median score more than three. 42 students had a median score equal to 3. So the true location of median score was not significantly different from 3(p=0.9633). Figure 4.

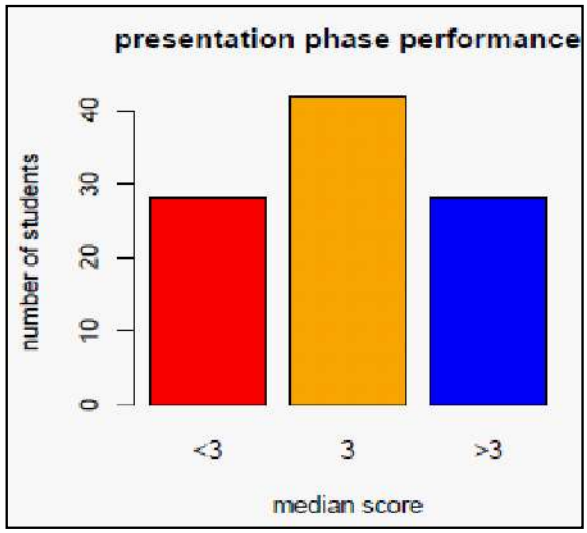

Figure 4

Discussion

Knowledge of medical sciences was previously based on learning plain empirical and observational facts which was memory oriented. With the rapid explosion of information, old method of teaching and learning are no more tenable. The situation demands a paradigm shift in our teaching and learning[4,5]. In order to tune to these situations a series of experiments are going on at global

level with regard to the changing modes of teaching and learning. These transformations are in conformity to the structure of the human brain where the capacity of short term memory is small but there is infinite capacity for long termmemory[6].

In this study, more than fifty percent of the students [54(55.10%)] have agreed to be benefitted by reading the literature from diverse sources which improved their understanding on the topic concerned with an increase in knowledge. A previous study done in Kasturba Medical College, Manipal University, Mangalore, Karnataka also reported a 53.75% increase in reading diverse and recent bibliographic sources for PBL [7].

Van den Hurk et al. noted that the performance in the presentation phase is a direct reflection on the process of preparation for the problem[8]. If the students are well versed on how to search for the literature from the given references, then the learning becomes more easy, under stable and interesting. In the present study also the students have shown a positive attitude in the preparation phase of PBL where the median score was more than three for [62(63.26%)] students. Proper search of literature with analytical understanding of the concepts and making notes and summaries goes a long way in making PBL successful.

The present study has reported uncertain acceptance for PBL [42(42.86%)] in regards to presentation phase. The percentage for acceptance as well as non acceptance for PBL was found to be same [28(28.57%)]. This could be due to the fact that some of the students are not comfortable to open up in front of their faculty and peer to answer or clear any doubts that they had for fear of being ear marked by the teachers or due to lack of confidence level. It may also be due to the presence of strict faculty or due to lack of interest by the student on the subject. The facilitator needs to play a very important role in identifying such students and give them timely counselling to boost up their morale and self confidence. A study done by Bijli Nanda of Sharda University, Greater Noida, Uttar Pradesh has reported that majority of the students coming from abroad believed that there was similarity in the student–teacher relationship in both the traditional method as well as in the PBL methodology. Whereas one third of the Indian students found PBL to be better, another third felt both the method to have equal weight and the remaining third opted for the traditional method in regards to student-teacher relationship. This could be due to the fact that that the students from abroad are already exposed to the PBL approach[9].

Discussions in small groups paved the way for better learning process[10]. Even the present study has shown an overall acceptance to PBL objectives with the true location of median score above3.

Conclusion

Based on the feedback results of the questionnaire, the future PBL sessions can be modified, planned accordingly and executed in a more productive way so as to nurture the development of reflective learning in students to bring maximum improvement in the educational outcome. The shortcomings seen in the presentation phase should be bridged to develop the attitude and professional wisdom of the students. Also, students can have a personal insight of their strengths and limitations with respect to a given area of learning[11]. To have better educational outcome, PBL must be used as an adjunct along with the traditional method.

Limitations: The study was done only to know the students perception towards PBL and not the level of knowledge gained by using it as a teaching methodology.

Conflict of Interest: There was no conflict of interests.

Source of Funding: Self funding .

Ethical Clearance: Ethical committee clearance has been given by institutional research committee vide letter no. AIMSR/IRB/RC/2018/06/35

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Effect of Dance Therapy on Stress and Anxiety in Working Women

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Abstract

Objective: To find out the effect of dance therapy on stress and anxiety in working women.

Method: A total of 41 women between age group 25 to 40 years were randomly selected to receive aerobic dance therapy. The program was conducted for 4 weeks, scheduled three days in a week, with a session of 10-20 minutes each day. Outcome assessment included perceived stress scale (PSS) and Hamilton anxiety rating scale (HAMA) which was recorded before and after completion of sessions.

Result: There was a reduction in levels of stress and anxiety after 4 weeks of aerobic dance therapy (p value < 0.0001) which was found to be statistically significant; whereas correlation between working hours and scores of PSS (r value -0.16) and HAMA (r value -0.06) Scales were statistically insignificant.

Conclusion: On the basis of results of our study we concluded that aerobic dance therapy was effective in reducing stress and anxiety in working women.

Keywords: *Aerobic dance, Stress, Anxiety.*

Introduction

The lifetime prevalence of stress and anxiety among general population of adolescent age group and young adults ranges between 5-70% in India.[1] The prevalence found worldwide for anxiety in men and women was 10.6% and 16.6% respectively, with a ratio indicating that prevalence is approximately twice among women than men.[2] From the people working for longer duration, it was found out that 8.2% males and (10%) females were suffering from symptoms of anxiety.[3] Prevalence of stress in working population for males was 13% and in females was 3%.With the developing industrialization and urbanization, the status of women has been changing due to which the levels of stress are seen to be elevated;the prevalence of stress was found to be 37% and for anxiety it was 40% among working women in India.[4]

Rapid changes in lifestyle and increasing competitiveness have led to a marked stress among working population.[5] There is an increase in the amount of stress level as women have to deal with both the stress from home as well as stress from work.[6] Symptoms associated with stress such as insomnia, fatigue, irritability, headache, depression, unhealthy behaviors like poor eating habits are commonly seen in working women.[5] Also prolonged stress can adversely affect the cardiovascular, endocrine and central nervous system. Chronic stress is the leading cause of anxiety. Symptoms produced due to anxiety are frequent panic attacks, phobic disorders like agoraphobia, social phobia and unpleasant thoughts.[7] Negative affective conditions are associated with concept of stress. Also, with precipitation of the episodes of anxiety and depression, a stress event of life leads to a characteristic stress response with involvement of chronic arousal and impaired functions. Consider as a mental state, the concept of a stress response has clear affinities with anxiety.[8]

There are certain physiological and biochemical changes that occur in the body with response to stress.

Physiological changes triggered by stress include increased respiration and volumetric consumption (VO_2), dilation of bronchioles and airways. Due to simultaneously increase in cardiac output and blood pressure there will be an increase in blood flow to heart, muscle and skin.[9] Biochemical changes triggered in stressful conditions activate two main pathways, sympatho-adreno-medullary axis (SAM) and Hypothalamus-pituitary-adreno axis (HPA). These two factors are activated by Corticotrophin Releasing Hormone (CRH) which causes release of ACTH by pituitary gland. In SAM, ACTH stimulates the adrenal medulla which releases catecholamines epinephrine and norepinephrine. In HPA axis, Adrenocorticotrophic hormone (ACTH) acts on adrenal cortex which releases Cortisol. Cortisol changes the metabolism of liver by increasing glucose and ATP which repairs the cells in response to stressful conditions.[9]

Along with physiological and biochemical changes there are some psychological symptoms of stress and anxiety such as, mental fatigue, depressed mood, sleep disturbances which aggregate distress and also affect the quality of life;[10] hence, it is necessary to quantify stress and anxiety. Various method used to quantify stress may includes, Singh's Personal Stress Source Inventory (SPSSI)[5], Cortisol for measuring stress level. Pss has good reliability score ICC, 0.86 with good supporting validity.[11] Also,there are various method used to quantify anxiety includeThe State and Trait Anxiety Inventory (STAI) instrument, Structured Interview Guides for Hamilton Anxiety Rating Scales (SIGH-A)[12]but, the test-retest reliability score for Hamilton anxiety rating scale is ICC, 0.86 and validity score is ICC, 0.57 which iseasy way to measure severity of anxiety symptoms.[13]

There are various pharmacological and non-pharmacological therapies used for the treatment of stress and anxiety. Pharmacological treatment consists of antidepressants, antipsychotic and anxiolytic drugs[14] and non-pharmacological treatment includes progressive muscle relaxation technique (PMRT),[5] yoga, behavioral therapy, psychoanalytical therapy, group therapy.[12] Also there are some art therapies such as painting, playing, sculpting, dance therapy and music therapy.[15] Astudy was done on effect of music intervention on stress and anxiety, results of study indicated that music interventions are effective in reducing stress and anxiety.[16] It has been documented that music interventions can decrease the level of stress and anxiety and increasing psychological well being, relieving physical, mental tension and regulates serotonin and dopamine level.[17] There are various types of dance which helps to reduce the stress and anxiety like ballroom dance, street dance, jazz, ballet dance and Zumba but aerobic dance has a highly positive impact in management of stress and anxiety.[18] Aerobic dance is one type of aerobic exercise, word aerobics means "with oxygen".[19]Analysis revealed improvements in fatigue, stress and anxiety were seenafter 10 minutes of exercise, with progressive improvements after 20 minutes and there was no additional improvement over longer period.[20]

Studies have shown a beneficial effect of aerobic dance on stress and anxiety;A study was done the effect of aerobic exercise on depression, anxiety in middle- aged adults, they concluded aerobic training had significant effects and according to the results they concluded that aerobic dance can improve mental health and enhance life quality.[21]

No study is conducted till date hence, this study is necessary to find out effect of aerobic dance on stress and anxiety among working women. The purpose of the study is to determine the effect of dance therapy on stress and anxiety in working women.

Materials and Methodology

Study Design: Pre and post test, Sample size-41, study place-Krishna hospital, Karad, study duration- 3 months, sampling method- simple random sampling, sessions duration-4 Weeks

Participants:

Inclusion Criteria: Working women of age group 25-40, who had mild to moderate stress and anxiety on PSS and HAMA scale scores and women who work for more than 6 hours per day were taken in the study.

Exclusion Criteria: Women with psychological ailments, past history of surgery, pain anywhere in the bodyof varying intensity, any physical injury, and subjects with cardiac and respiratory conditions were excluded from the study.

Outcome Measures: Outcome measures were recorded prior to the 4 week aerobic dance therapy program and again recorded at the end of the program.

1. Perceived Stress Scale 14- PSS 14was given to the subjects which consisted of 14 questions and subjects were asked to fill it by circling the numbers

given in them where, 0=Never, 1= Almost never, 2= sometimes, 3= fairly often, 4=very often and scores were obtained by reversing the scores on the seven positive items 4,5,6,7 and 9 and then summing across all 14 items.[11] A total score range of PSS -14 was 0-56 where <14 indicates mild stress, 15-28 moderate stress and 43-56 indicates severe stress.[24]

2. Hamilton Anxiety Rating-The scale consisted of 14 questions which were filled by the subjects by marking the numbers given in the scale. In which 0= Not present, 1= mild, 2 = moderate, 3= severe, 4=very severe. After addition, a total score range of 0–56, where <17 indicates mild severity, 18–24 mild to moderate severity and 25–30 moderate to severe.[13]

Interventions: The study was designed into three parts as pre-test, the specific training program and post-test. The program was continued for 4 weeks, scheduled three days in a week, having sessions of increasing intensity and duration. In 1st and 2nd week aerobic dance intensity was low and duration was 10-15 minute. In 3rd week and 4th week intensity of aerobic dance was moderate to high and duration was 20- 25 minutes. The training program scheduled as follows.

Table No. 1: Dance therapy session protocol

	1st week	2nd week	3rd week	4th week
Warm-up	2 min	2 min	2 min	5 min
Aerobics	5 min	10 min	15 min	15 min
Cool Down	2 min	2 min	2 min	5 min

Warm up- Stretching of pectorals, stretching of neck muscles, capsular stretching, hamstring stretch, quadriceps stretch, calf stretch, trunk side flexor stretch,lunge stretch, arm rotations, neck rotations, waist twist, wrist rotation, hip rotation,half squats, jumping jacks.

Training program- Heel digs, grapevine, V- box, A-box, front lunges, side lunges, shower dance, skipping, diagonal toe touch, punches, hamstring curls, criss cross with arm movement, toe touch, marching, grapevine with hamstring curls.

Cool down- Stretching of pectorals, stretching of neck muscles, capsular stretching, hamstring stretch, quadriceps stretch, calf stretch, trunk side flexor stretch, lunge stretch, hand kicks, jumping jacks, half squats.

Dance therapy was conducted in well ventilated room and it was carried out in standing position. In warm sessions and cool down sessions, the hold time for stretching was maintained for 10 seconds. From 3rd week onwards, the main workout session was done twice.

Results

1. Age distribution in the study:

Table No. 2: Age distribution

Age	No. of Subjects
20-30	32
30-40	9

2. Comparison of pre and post scores in stress and anxiety:

Table No. 3 comparison of pre and post in stress and anxiety using pss and hama scale

Parameters	Pre Mean ± SD	Post Mean ± SD	Mean DIFF	t value	p value
PSS	28.61±4.73	26.29±4.07	2.31	4.629	< 0.0001
HAMA	16.02±8.79	13.17±8.42	2.85	8.783	< 0.0001

3. Correlation between working hours, PSS and HAMA scale:

Table No. 4: Correlation between working hours, PSS and HAMA scale

Parameters	'r' value	Remark
PSS	-0.16	Not significant
HAMA	-0.06	Not significant

From the above table it is clear that effect of aerobic dance in working women with the use of the parameters PSS and HAMA scales was found to be statistically extremely significant as both the p-value were noted to be (< 0.0001).

Statistics: The outcome measures were used to assess, before the sessions and after completion of sessions. Data analysis was done using paired t test

and analysis was performed using SPSS (version 22). Statistical significance was accepted for values of $p<0.05$ at 95% confidence interval.

Discussion

Stress and anxiety are highly prevalent in the general population.[1] Ability to cope with improving industrialization and competitiveness, the level of stress is increased. Stress and anxiety is more common in women who work for more than 55 hours a week.[22] In the current study, 41 women between the age group of 20-45 years fulfilling the inclusion criteria were included.

Statistically the present study showed that, there were considerable changes in the outcome measures with significant difference seen in stress (mean difference=2.31) (p value <0.0001) and anxiety (mean difference 2.85) (p value<0.0001) levels in working women. In our study we analyzed that the changes in perceived stress scale for stress and Hamilton anxiety rating scale for anxiety, after incorporating aerobic dance therapy for total 12 sessions in duration of 4 weeks were found significant results. It has been studied that aerobic dance therapy offers a way for an individual to defend against stress and anxiety by releasing endorphins and neurotransmitters that increases the feeling of well being which can relieve the stress and anxiety and also it gives positive effects on both musculoskeletal and cardiovascular system and hence maintain good fitness.[23] A study investigated effects of 12 weeks of dance intervention on psychiatric patients with stress and depression they found out that significantly less depression in subjects who participated in dance group than the subjects in music therapy session.[15]

A study was done on effect of aerobic dance for 1 hour session conducted each day for 6 weeks. They found that aerobic dance has highly positive impact in the management of stress related problems and practicing aerobic dance has been shown to improve and sustain physical as well as mental efficiency.[19] A study was done on effect of dance therapy on cardiovascular parameters for 4 weeks they found out that dance therapy was effective on cardiovascular parameters[23] similarly,we set the program for 4 weeks to check whether dance therapy is effective in reducing stress and anxiety, the results were found to be significantly effective in reducing stress and anxiety in working women.

In our study at the end of 4 weeks, it was recorded that the correlation between working hours, stress and anxiety was statistically not significant. But there was statistically significant difference between pre-interventional and post-interventional values of stress and anxiety in a group of working women thus, concluding that there is a positive effect of aerobic dance on stress and anxiety in working women.

Conclusion

On the basis of the results of our study, it was concluded that aerobic dance therapy was significantly effective in reducing stress and anxiety in working women. And it has highly positive impact in management of stress and anxiety related problems.

Ethical Clearance: Ethical Clearance is taken from Institutional Ethics Committee of Krishna Institute of Medical Sciences Deemed to be University, Karad.

Conflict of Interest: The authors declare that there is no conflict of interest concerning the content of the present study.

Source of Funding: This study was funded by Krishna Institute of Medical Sciences Deemed to be University, Karad.

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A Study on Effect of Favorite Film Songs on Heart Rate Variability (HRV) and Heart Rate (HR) with Moderate Exercise

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Abstract

Introduction: Heart rate variability (HRV) is the physiological event of variation in the time interval between heart beats. It is measured by the variation in the beat-to-beat interval (R-R interval).The present study aimed at determining the effect of favorite film songs on HRV and HR with moderate exercise.

Materials and Method: This was a cross sectional observational study conducted in the department of physiology, Vinayaka mission's medical college & hospital. Participants were allowed to select favorite slow tempo and fast tempo film songs. Selected songs were played (4-5 minutes) before and during exercise, with 30 minute interval (each day N=10) and their HRV and HR were measured by using time and Frequency domain method. (Standard instrumental protocol was followed).

Results: In this study, participants were able to do exercise at a lower HR with a slow tempo film song when compared to no music or film song during exercise the cardiac activity the HR and HRV was improved and fast recovery too. It was observed that the musical therapy improved the time and frequency domain indices of HRV.

Conclusion: The present study clearly indicates that, a particular favorite tempo of a film song or music has a beneficial effect on HRV and HR changes through the involvement of the PSNS and SNS.

Keywords: *Favorite film songs, Heart rate variability, Heart rate.*

Introduction

Heart rate variability (HRV) is the physiological event of variation in the time interval between heart beats. It is measured by the variation in the beat-to-beat interval (R-R interval).[1] The beat-to-beat alterations in HRV, is an accurate and reliable reflection of the many physiological factors modulating the normal rhythm of the heart. Further, HRV testing is a prognostic (predictive) indicator of cardiac condition, fitness, stress levels, aging, health risk levels and chronic disease condition.[2]

HRV is the immediate variation in heart rhythm due to ANS influences on the Sinoatrial node (SA node).Previous researchers showed that the high HRV indicating good health and a high level of fitness, whilst decreased HRV is linked to stress, fatigue and even burnout. The intervention of music indicating positive effect on HRV. [3]An individual's relaxation response is based on his music generi, which is composed of different basic compositional elements, such as melody, rhythm, harmony, and tonality. Earlier studies had shown the relaxation effects of classical music at both the subjective and objective levels.[4]

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It was also indicated that the music therapy has positive effects on HRV in sick patients and also soothing music has a significant effect on decreased HR and improved HRV in healthy youth. HRV alterations relate to the rhythm of the particular type of music.[3] The classical, meditation or relax music are capable of bringing out a number of health benefits including, raising states of consciousness, lowering stress level, changing moods and accessing different states of mind.[5]

Individualizing the type of music used is vital to the success of music therapy and the degree of love towards music is the most important factor in relaxation. In recent years, most of the individuals prefer film songs as a part of relaxation and also individual's preference may vary such as slow tempo or fast tempo songs. These days most of the people while jogging, doing exercise or fitness training frequently, listen to music through the headphone or earphone.

The present study aimed at determining the effect of favorite film songs on HRV and HR with moderate exercise.

Materials and Method: This was a cross sectional observational study conducted in the department of physiology, Vinayaka mission's medical college & hospital. Study was explained to the participants and informed consent was obtained. Study was approved by institutional ethical committee.

Song and Music Selection: Prior to the experimental session, participants were asked to self-report a title of their most favorite film songs (Song by the human voice with composed instrumental music) orally confirmed. Depending on their interest, the fast and slow tempo selected film songs played, then the songs or music were separated based on tempo, the tempo was calculated based on beats/ minute. The Piston soft BPM Detector software was used to find the tempo of a song. 70-80 beats/ minute (BPM) consider as slow tempo, 140-160 beats/minute songs were fast tempo, medium tempo 90-100 beats/ minute.

Film song Intervention:

A. For favorite slow tempo film song intervention, a complete slow song was played (4-5 minutes) before and during exercise, with 30 minute interval (each day N=10) and their HRV and HR were measured.

B. For favorite fast tempo film song intervention, a complete fast tempo song was played (4-5 minute) before and during exercise, with 30 minute interval (each day N=10) and their HRVand HR.

Exercise: In this study, Bicycles Ergometer for exercise was used. All the participants were instructed pre-test one week before the testing to overcome factors that could alter HRV. They will be asked to avoid heavy physical activity, smoking and alcohol and other beverages affect physical activity.

HRV Analysis: Time and Frequency domain method. (Standard instrumental protocol was followed)

Inclusion Criteria: Participants (N= 310) included 160 males and 150 females with an average age of 19 years (ranging from 18 to 23) with normal body weight. All the participants were tested initially -physical fitness, body mass index (BMI), height, waist and hip circumference, The participant's weight was calculated by a digital balance (INCO, India), BMI and with normal body weight and further the participants reported no significant hearing loss and no cardiac conditions were included in the study.

Exclusion Criteria: The participants were screened for self-reported hearing loss and cardiac history using a screening questionnaire. Participants with significant hearing loss or cardiac anomalies, diabetic, pregnant, heart failure, acute and chronic renal failure or any chronic diseases were excluded from the study.

Statistical Analysis: Descriptive data are expressed as mean ± SD, ONE WAY ANOVA was used to analyze the HRV and HR. The level of significance was analyzed. All data were analyzed using SPSS for Windows version 17.0.

Results

A total of 310 participants included in the study. 160 males and 150 females with an average age of 19 years (ranging from 18 to 23). This present study showed that the selected young subjects were able to do exercise at a lower HR with a slow tempo film song or slow tempo instrumental music when compared to no music or film song during exercise the cardiac activity the HR and HRV was improved and fast recovery too.

Table 1: Effect of slow tempo film song on HR. (Frequency Domain Analysis)

Parameters normalized units (nu)	No song played (baseline) Mean ±SD	Slow tempo film song Mean ±SD	Exercise only No song played Mean ±SD	Exercise + slow tempo film song Mean ±SD	P value
Low frequency(LF)Hz	39.82±5.25	39.02±4.21	50.48±5.31	49.08±4.81	P<0.001
High frequency (HF)Hz	60.74±5.47	63.33±3.39	48.91±5.80	54.95±6.37	P<0.001
LF/HFms²	0.864±0.05	0.602±0.05	1.07 ±0.16	0.88±0.23	P<0.001

Mean values of low frequency (LF), High Frequency (HF) and LF/HF. (Values are Mean ± SD), Pvalue<0.001 is significant. (N=310)

Table 2: Effect of fast tempo film songs on HRV (Frequency Domain Analysis)

Parameters normalized units(nu)	No song played (baseline) Mean ±SD	Fast tempo song Mean ±SD	Exercise only No song played Mean ±SD	Exercise + Fast tempo song Mean ±SD	P value
Low frequency(LF)Hz	61.44±5.36	63.32±3.24	51.61±6.80	56.83±5.23	P<0.001
High frequency(HF)Hz	41.83±6.22	36.02±4.31	50.49±4.31	45.06±4.21	P<0.001
LF/HFms²	1.391±0.04	1.839±0.06	1.013 ±0.04	1.214±0.18	P<0.001

Mean values of low frequency (LF), High Frequency (HF) and LF/HF. (Values are Mean ± SD), P value<0.001 is significant. (N=310)

Table 3: Effect of Slow tempo film song on HR and HRV SDNN and RMSSD (Time domain analysis)

Parameters	No song played (baseline) Mean ±SD	Slow tempo song Mean ±SD	Exercise only No song played Mean ±SD	Exercise + slow tempo film song Mean ±SD	P value
Mean RR(ms)	804.32±11.92	706.75±10.5	550.54±6.11	700.74±6.99	
SDNN(ms)	64.10±11.11	55.11±2.11	50.32±14.32	76.84± 3.11	
Mean HR (beats/minute)	78.24±3.2	68.5±11.21	98.2±3.4	80±3.96	P<0.001
RMSSD(ms)	45.17±13.21	40.32±7.88	45.22±12.3	70.99±4.67	
NN50	7.67±5.4	6.55±4.37	5.76±11.89	15.81±6.48	

The R-R Interval between R to R,Heart rate (HR), The Standard deviation of normal-to-normal R-R intervals (SDNN), the percentage of the adjacent RR intervals with a difference of duration greater than 50 ms (pNN50) and root-mean square of differences (RMSSD) between the adjacent normal RR intervals in a given time interval (N=310).

Table 4: Effect of Fast tempo song on HR and HRV SDNN and RMSSD (Time domain analysis)

Parameters	No song played (baseline) Mean ±SD	Fast tempo song Mean ±SD	Exercise only No song played Mean ±SD	Exercise + Fast tempo film song Mean ±SD	P value
Mean RR (ms)	704.33±11.92	606.76±13.5	600.54±7.11	807.84±6.99	
SDNN (ms)	65.10±12.11	60.12±10.11	55.32±14.32	77.84± 3.11	
Mean HR (beats/mintes)	78.24±32	89.7±11.21	100.2±3.9	120±3.56	P<0.001
RMSSD (ms)	45.17±13.21	40.32±7.88	45.22±12.3	70.99±4.67	
NN50	10.67±13.4	8.56±4.37	6.77±12.89	15.81±8.98	

The RR interval between R to R, heart rate (HR), The Standard deviation of normal-to-normal R-R intervals (SDNN), the percentage of the adjacent RR intervals with a difference of duration greater than 50 ms (pNN50) and root-mean square of differences (RMSSD) between the adjacent normal RR intervals in a given time interval.

Discussion

In this study, participants were able to do exercise at a lower HR with a slow tempo film song when compared to no music or film song during exercise the cardiac activity the HR and HRV was improved and fast recovery too. The relation of music to emotion has been studied for decades and the literature is fruitful.[6]

Our results showed that the favorite slow song has a definite peaceful effect on exercise induced changes in HRV which is in agreement with the work of Pal et al.[7]In their study, the practice of relaxation of song therapy has significant effect in lowering the LF/HF ratio of HRV inparticipants. The present study showed that, listening to slow tempo film songs during exercise increases the HF and listening fast tempo film song or fast tempo music listening during exercise increases the LF. Increased HF indicates PSNS tone increased. [8]But, LF index communicates to both vagal and sympathetic influences on the heart, yet providing predominance of the sympathetic component.[9]

Chuang and co-workers investigated the effects of long-term, 8-month music therapy intervention on autonomic function in anthracycline-treated breast cancer patients. Theauthors observed that the musical therapy improved thetime and frequency domain indices of HRV.[10]Studies on competition stress have been observed to decrease HRV and alter the power spectrum by decreasing the High Frequency (HF) component, increasing the Low Frequency (LF) component.[11] Experimental studies have also shown that athletes report increased positive affect and reduced negative effect in conditions where they listen to arousing music, compared to no music, during moderate to high intensity activity.[12]

As per the study conducted by Lathaet al. The observations obtained revealed that heart rate and mean RR intervals showed significant changes between the music and non-music group in both genders and there was a significant decrease in the RMSSD, SDNN and PNN50 in the male population suggesting a shift towards enhanced vagal activity. From this it could be inferred that music has beneficial effect on the heart rate variability thus favouring cardiovascular health in its long run.[13]

The present study had limitations that affect generalized ability of its results. The study was conducted acute, only in the age group of 18 to 23-years-old with normal BMR. Moreover, only healthy subjects were evaluated in order to homogenize the study sample.

Conclusion

The present study clearly indicates that, a particular favorite tempo of a film song or music have a beneficial effect on HRV and HR changes through the involvement of the PSNS and SNS.

Ethical Clearance: Taken from institutional ethical committee

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Conflict of Interest: Nil

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A Proximate Analysis of Phytochemical in Sonalum Trilobatum after the Addition to Leavened Yeast Goods with Sensory Evaluation

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Abstract

Herbs are used as a medicine in curing various diseases, Due to many reasons in recent days the Respiratory-related health issue has become one of the major problems faced by most developing countries. The constant rise in pollution from vehicular traffic, factory smoke emissions and other factors have to lead to a steady rise in global warming. As a result of these factors, certain allopathy medicines fail to have its complete usefulness on ones Therefore to achieve the natural changes and progress a neutralised therapy will help resolve this problem. By incorporating *solanum trilobatum* in bread we can gradually indicate respiratory-related health issues effectively. Since bread is the widely used commodity all over the world. It will help in resolving the deficit. The objective behind this study is to make over the human body in tune with nature. It is our effort to introduce *solanum trilobatum* in 3 different proportions into bread by testing it on the basis of liking, acceptance, taste, etc. It was observed that the procedure resulted in a product that can be effectively accepted and implemented.

Keywords: *Solanum trilobatum, bread products, anti-oxidant.*

Introduction

Solanum Trilobatum is one among the Indian traditional herbs that helps to cure many diseases in the human body. It has been elaborately used in Siddha medicines. The nature of this is, its leaves are covered by thorns, the flower is purple in color,and fruit is red in color. AS the thorn is toxic, it should be removed before using it. *Solanum trilobatum* is known for its nutritional value and numerous health benefits, such as sodium potassium, phosphorous,zinc magnesium and iron. Each part of this plant can be used for various purpose. People in India usually use them in a powder form after dehydrated by sun light; and stored in air tight container. This powder is mixed along with cooking commodities or can be made as decoction and is commonly consumed an empty stomach as per elderly advice[1]. There are numerous home recipes are not revealed out of which to maintain its traditional secrecy. Many of the herbal recipes not recorded. This kind of recipes in every day food or medicines when consumed more than prescribed levels can cause adverse side effects. Proper knowledge of right ratio before intake is most essential before using this for consumption This research was aimed at the incorporation of the *solanum trilobatum* in bread as a medicine substitute to help recover from diseases[2]. In this research, we have used *solanum trilobatum* for making herb bread with different proportion ranging from (10%, 20% and 30%) in a normal bread dough recipe such as soup stick, bun and rusk. The sample were then allowed to be examined by forty untrained customers and were used hedonic scale asked to rank their observation. Then the results were concluded from the sensory evaluation

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of the observation provided by the customers. The tested products were found to have better taste, texture, aroma,and appearance observed by the customers. Most of the multi-grains used in bakery industry

Cereals used in bread: Though the cereals are used to be cultivated in the Nile region and the major source of the good and best quality bread making wheat flour and all-purpose flours. There are many different varieties the durum wheat type is best known for RYE (Secalecereal): Probably of southwest Asian Origin, rye is similar in composition to wheat[3]. In Europe, it is used mainly for making rye bread and crisp bread (particularly in Scandinavia). It is also used in the manufacture of drinks: whiskey in America, Beer in Russia. Millet (Panicum miliaceum): The kernel obtained from the cultivation is widely consumed as a cereal in continents likeAfrica and Asia. It is also used as a source of starch in Russia. CORN (Zea mays): which is Native to Mexico and in some parts of South America, The major grain commonly consumed is corn kernels and it is consumed in various forms during their meal like tortilla made out of corn flour. The corn flour is used in making many Mexican specialties like burritos, Tacos, Nacos, Quesadillas, and Enchiladas. This consumes additional time and liquid than normal grain.

Herbs: The herbs accessible has its bioactive parts which help to turn away and fix any disease. The*solanum trilobatum* is an herb in like manner contains all of the 8 principal amino acids making it one of just a bunch couple of plants that give an all of protein source[4]. It is well off in flavonoids, including Quercetin, Kaempferol, Beta-sitosterol, caffeoylquinic destructive, and zeatin. As well as the herb like *Rosmarinus officinalis,* generally called nursery rosemary, is a nearby to the Mediterranean zone. This herb is a native to mint family, it is an evergreen bramble in like manner related to basil, marjoram, and oregano. It is typically found creating by the ocean, and its Latin name thinks about to "dew of the sea." 4Oregano begins from Origanum, an assortment of the mint family. Oregano at first began from warm environments in western and southwestern Eurasia and the Mediterranean locale. Oregano is a suffering plant that has the properties of herbs, green and leaflike, with round framed leaves [5].

Types of Bread: White bread has a variety of tastes and texture that add delight to meals and snacks. White flour is also an important ingredient in many dark breads which would not raise sufficiently Cottage bread is moist and flaky. It has, however, a somewhat coarser texture than other white loaves. Baked in a casserole, it is easy to preparein the oven in about an hour. When it comes out of the oven an hour later, brush with melted butter, sprinkle with salt and serve[6].A Middle Eastern bread these small loaves puff into hollow balls that can be filled with sandwich spread or butter and honey.[5] Buttermilk bread has a country kitchen lilt, and this loaf has a country –kitchen taste. It is light, of good texture, has a golden-brown crust and creamy white insides[6]. It keeps for a long period deep frozen and makes delicious toast. [6]Fork bread: Bread is rich and tenders a deep, dark brown crust surrounding a lovely yellow interior. [6]Bran, the brown, flaky outer covering of the wheat kernel, has a nut-like flavor and is often mistaken for one of several breakfast portions of cereal with almost the same name. They are bran, too, but of different texture and form. Hardly as exotic in flavor or appearance as its place of origin- Hilo, on the big island of Hawaii-this bread, from a recipe member of the Hilo women's club, is a good straightforward bran loaf .bran and molasses bread. There is an unusual wheat flavor about this bran bread that is underscored by the dark [7]unsulphured molasses. The bran particles are believed to cut the gluten stands which reduce the size of the loaf compared to a loaf off-white made with the same volume of flour. Oats bread Oats have had a plebeian upbringing, mentioned as a weed by the classical writers of Rome, and used infrequently in medicines[7]. In the early Christian era they grained some stature as a foodstuff, yet despite their ability to add flavor and good texture to the bread, oats have come down through the centuries principally as a food for livestock. Blended bread. The bread made with the blended grains are coarser, denser, and darker than most other loaves. They taste of no one grain but the meld of them all. In the seven recipes, there is a total of seven different flours and cereals of French bread in France, bread is seldom baked in the home because the boulangerie is just around the corner producing its bounty of golden loaves, six days of the week potato bread. The potato grew wild in Peru and was taken to Europe by Spanish explorers in 1530.

Materials and Method

The ingredient was sourced as whole grains from a local grocery store as whole grain. It was then combined together and further milled and then stored in airtight containers before its actual use. The recipe was tried in the department of Hotel and Catering Managementat Vels University, Chennai during 2018-2019 in the

month of January

Recipe:

Serial Number	Ingredients	Quantity
1	Multigrain flour	200g
2	Yeast	5g
3	Salt	3g
4	Water	120ml (100ml-120ml)
5	Gingely oil	20ml
6	Sugar	20g

A percentage of 2 grams, 4 grams and 6 grams *solanium trillobatum* was used in three different proportion sample. It was observed that the dough did not crack in spite of having lesser gluten percentage[8]. The dough shaped into soup sticks, sunrise, mini buns etc. The shaped rolls were placed on a clean baking tray and further rested for 15 minutes. It was then baked in an oven at 170*c for 18 minutes to a color of light golden brown.

Results

Sensory Evaluation: The bread prepared with the addition of *solanum trilobatum* in various ratios and shapes was sent for sensory evaluation and their likes and dislikes are identified through hedonic scale.

Table 1: Sensory Evaluation of Soup Stick

	Disliike Extremely	Dislike Very Much	Dislike Moderarely	Dislike Slightly	Neither Like Nor Dislike	Like Slightly	Like Moderately	Like Very Much	Like Extremely
Colour	0	0	0	1	2	10	11	2	1
Taste	0	0	1	1	3	10	12	0	0
Aroma	0	0	0	3	5	11	6	2	0
Appearance	0	0	0	1	0	0	0	0	0
Texture	0	1	1	2	0	0	0	0	0
Acceptance	0	0	2	1	0	0	0	0	0

Table: 2 Sensory Evaluation of Sunrise Shape

	Disliike Extremely	Dislike Very Much	Dislike Moderarely	Dislike Slightly	Neither Like Nor Dislike	Like Slightly	Like Moderately	Like Very Much	Like Extremely
Colour	1	0	1	2	3	4	3	9	3
Taste	0	0	0	0	3	5	7	10	1
Aroma	0	0	0	0	1	9	2	11	2
Appearance	0	0	2	1	1	6	6	10	1
Texture	1	0	0	1	3	6	6	9	1
Acceptance	0	0	0	0	0	6	3	8	3

Table: 3 Sensory Evaluation of Bun Shape

	Disliike Extremely	Dislike Very Much	Dislike Moderarely	Dislike Slightly	Neither Like Nor Dislike	Like Slightly	Like Moderately	Like Very Much	Like Extremely
Colour	0	0	2	3	6	4	5	3	3
Taste	0	0	0	5	4	9	4	2	2
Aroma	0	1	2	2	6	5	5	3	2
Appearance	0	0	1	2	1	6	10	2	4
Texture	0	0	2	0	5	4	6	7	2
Acceptance	0	1	0	4	1	6	3	3	4

Discussion

The bread products made with the addition of *Solanum trilobatum* is used as a sample, taste, texture and colour was good and found to be acceptable in this survey through sensory evaluation in Table 1, Table 2, Table 3. The taste of this product shows higher percentage in Table 3 as colour and aroma also satisfactory. and this food is tested for its phytochemical compounds present after the cooking process the results shows likes and dislikes with the prepration method and In the present examination, the Multigrain Bread fused with thuthuvalai and healthful screening and capacity were researched[10]. The proximate, basic, phytochemical investigation of sustenance test analyzed. The outcomes were talked about as underneath. The real constituents in the consumable bit are water, protein, sugar, lipid (fat or oil) and fiery remains (minerals). Investigation of these essential constituents is frequently alluded to proximate examination[11]. Proximate investigations of nourishment test assume a pivotal job in surveying their dietary hugeness and help to get to the nature of the example (Pandey et al., 2006). Consequences of the proximate sythesis in examined test materials are given in Table 4.

Table 4: Proximate configuration of Extract

Content	Quantity
Moisture content (%)	8.46
Ash (%)	3.41
Crude fibre (%)	4.23
Protein (%)	63.75
Fat (%)	3.42
Carbohydrate (%)	17.12

Minerals are gotten from the soil outside layer. Through the impacts of the climate, shakes that contain minerals are ground into littler particles, which at that point become some portion of the dirt. The mineral substance in the dirt is consumed by developing plants[12]. The plants are devoured by the two creatures and individuals as sustenance. This mineral turns out to be a piece of the natural way of life. The real minerals fill in as basic parts of tissues and capacity in cell and basal digestion and water and corrosive base parity[13]. Consequences of the significant minerals are yielded Table 5.

Table 5: Mineral composition of powder

Contents	Sample Extract (mg/100g)
Calcium	165.43
Potassium	127
Magnesium	88
Zinc	12.42
Iron	65.87
Phosphorous	132.45

Phytochemicals Study: The Phytochemicals hasNutraceuticals significance ofelements which support in advance wellbeing is happen with a convergence in sustenance of pharma businesses[14]. Thesematerials will go to separated supplements, nutritional enhancements with explicit weight control plans to hereditarily built originator sustenance's, natural items, prepared nourishments and refreshments. Isoflavonoids, Phytochemicals present in the herb are comprehensively depicted as phytosterols,limonoids,t erpenoids, carotenoids, phytoestrogens, polyphenols, flavonoids, anthocyanidins and glucosinolates[15]. They have gigantic effect on the social insurance framework and may give therapeutic medical advantages including the counteractive action and additionally treatment of ailments and physiological issue. Lion's share of sustenances, for example, entire grains, beans, natural products, vegetables and herbs contain phytochemicals of nutraceutical significance[16]. These element of phytochemicals more over unaided as well as in blend, have colossal restorative potential in relieving different sicknesses including malignant growth, diabetes, stomach ulcer, Heart related infections, and blood pressure and so on. In the present examination, tannin, flavonoids, steroids, alkaloid and polyphenol were available in the tried example. The nearness of these mixes shows the beneficial outcome on the wellbeing.

Conclusion

The phytochemical study of *solanum trilobatum* herb shows that it is loaded with various minerals with good nutritive value and an proximate analysis of this herb states that this can be stored for a longer period when it is prepared with a combination of all-purpose flour and other yeast made ingredients like sugar, salt,water,*solanum trilobatum* powder to make a bread[6].

The sensory evaluation of this bread on taste, texture and appearance gave maximum satisfactory levels, also we believe the tested products using it can help people with respiratory problem as it has magnesium and iron in it. The popularity of bread products in the market gluten-free bread wholemeal bread rye bread Repopulation is taken place in the bakery industry due to the various lifestyle-related diseases in the search of healthy products with this intention multigrain bread commonly known as one traditional grain leaving more healthy bean used in the bakery for making of a variety of bakery products.

Ethical Clearance: Not required for this article.

Conflicts of Interest: Conflict of Interest declared none.

Source of Funding: Self

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Satisfaction Level of Physiotherapy Students in North India

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Abstract

Background: Physiotherapy or physical therapy is one of the allied health services that is used to improve patient's quality of life without use of drugs. This service helps in restoration and improvement of function by applying manual therapy, physical modalities, therapeutic exercises and hydrotherapy etc.

Study Design: A Randomized Survey Design.

Objectives: To find out satisfaction level among physiotherapy students of North India.

Method: Total 161 students from Physiotherapy colleges of North India, voluntary participated in the study among which 55 were male and 106 were female. Inclusion criteria were students of third-year and fourth-year of Bachelor of Physiotherapy degree; both male and female with age limit 19-24 years. First-year and second-year students, Postgraduate students, interns and professionals were excluded from the study.

Results: Average score of DREEM Questionnaire was 127. In the questionnaire, there were five questions (i.e. 1, 2, 10, 18 & 19) that scored highest value and showed high satisfaction rate. Total 142 students (88.19%) were happy to choose this particular field while 19 students (11.18%) were unhappy.

Conclusion: Out of 161 students, 142 students (88.19%) were happy to choose Physiotherapy field. Physiotherapy students of North India have high satisfaction level towards Physiotherapy course.

Keywords: *Physiotherapy, Satisfaction level, DREEM inventory questionnaire.*

Introduction

Physical therapy is defined as "the restoration or treatment of physical deformities, contractures or pain by applying various exercises, electrotherapeutic modalities, mobilizations, manipulations and hydrotherapy etc. without use of any medications oroperative procedure"[1]. The **APTA** (American physical therapy association) defines Physical therapy in which physical therapists examines the patients completely and after that makes an effective treatment plan which primarily focuses on relief of pain, increase range of motion, improvement infunctions and prevention of deformities because of any pathology associated with musculoskeletal, neurology, pediatric, sports, obstetrics and gynecological conditions[1].

Evolution: Electrotherapy (such as water therapy, hot, cold and electric current) mainly used by physiotherapists were developed in Greece by Hippocrates, who is considered as Father of Western Medicine. Various exercises were used in the era of 1500s, 1600s, and 1700s in Europe for the treatment of myopathies, degenerative disorders, bony dysfunctions and many more. At the time of 1800s, sensory or muscle re-education were used to treat various neurological or orthopedic disorders and injuries. Physiotherapy mainly originated during the World War I which required the

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treatment of army soldiers mainly injured in war. The outburst of poliomyelitis in the United States during 1920 to 1930 resulted in urgent need of physical therapy. Many individuals in the United States required short term and long term Rehabilitation after the 2nd World War. This raised the physical therapy standard [2].

***Physical Therapy Course Work*:** To raise the profession, university decided to start the basic level course for physical therapy to train the nurses and individuals. To initiate this, University of Southern California in 1992 and Creighton University of Nebraska in 1993, start DPT. This was 2 years diploma in physical therapy. Then bachelor's degree was initiated. Presently, it isof 4 and 1/2 year degree. Then,Initiation of master's degree programs started in physical therapy. It was 2 year specialization degree (American Physical Therapy Association, 2003).At present, a number of universities are offering PhD program in Physiotherapy.

Career in physiotherapy: Physiotherapists are offered clinical jobs ingovernment as well as private hospitalsand academic jobs in institutes, colleges and universities. Physiotherapy services are also required in geriatric and pediatric rehabilitation centers as well as with sports team and individual sports persons. It is also required in corporate sector for prevention and management of work related injuries.

***Current issues in physiotherapy*:** The current issues in Physiotherapy in India are students' perceptions about their profession, career opportunities, level of remuneration, job satisfaction, job retention, patient referrals and public awareness about physiotherapy etc[3]. Student's perception, learning behavior & education is the most important basis for any professional growth and educational satisfaction among students. Thus, World Federation for Medical Education focused on evaluating learning behavior and educational environment[4].

The rationale for DREEM inventory questionnaire was to investigate the role of academic environment in student's learning, perceiving and any effect on their growth, profession, progress, behaviour and social well-being[5].

Methodology

***Eligibility criteria*:** The present study was randomized survey design. Inclusion criteria were3rd & 4thyear undergraduate students,both males & females with age from 19 to24 years pursuing Bachelor's of Physiotherapy degree.An exclusion criterion wasfirst-year and second-year students, Postgraduate students, interns and Physiotherapy professionals.

Tools and Instrumentation: Student's satisfaction level was evaluated by using "**DREEM (Dundee Ready Educational Environment) inventory questionnaire"** and the data collected was kept confidential. DREEM inventory constitutes 50 questions, that are simple, self-allocated and closed-ended questions related to academic environment, teaching and learning[6].Each question consists of 4 to 0 score on a "**5-point Likert response"** as follows: [4= strongly agree; 3 = agree; 2 = unsure; 1= disagree and 0 = strongly disagree]. Averagescores between 3 and 4 mainly indicatetheir satisfaction, questions with anaverage score of 2 represents dilemmaand scoresof 0 and 1 indicate dissatisfaction. There were some negative questions that are question number 4, 8, 9, 17, 25, 35, 39, 48, and 50. Their scoring was reversed.

Procedure: The survey was conducted at different institutes of north India including Haryana, Chandigarh, Punjab, Delhi and Uttar Pradesh. The participation was voluntary. A stratified random probability sampling was used for data collection. The questionnaire was given to undergraduate physiotherapy students. Voluntarily participation was there, and the questionnaires were kept confidential. Total 161 Physiotherapy students participated in the study voluntarily,among them 55 were males and 106 were females.

Results

142 students (88.19%) were happy to choose Physiotherapy field while 19 students (11.18%) were unhappy. Average value of DREEM Questionnaire was 127.In this questionnaire, five questions (i.e.1, 2, 10, 18 & 19) that scored highest value and showed high satisfaction rate. Figure-1 demonstrates satisfaction scale. Figure 2 to 6 demonstrates question's with highest Physiotherapy response value.

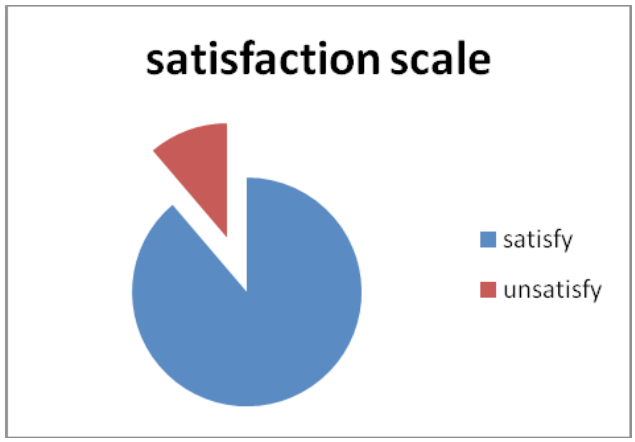

Fig. 1: Satisfaction level perceived by Students

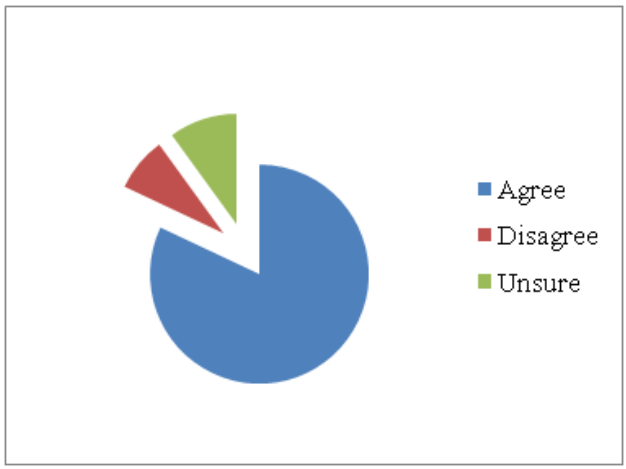

Fig. 2: (Q 1). "I am encouraged to participate in class". (Score -132)

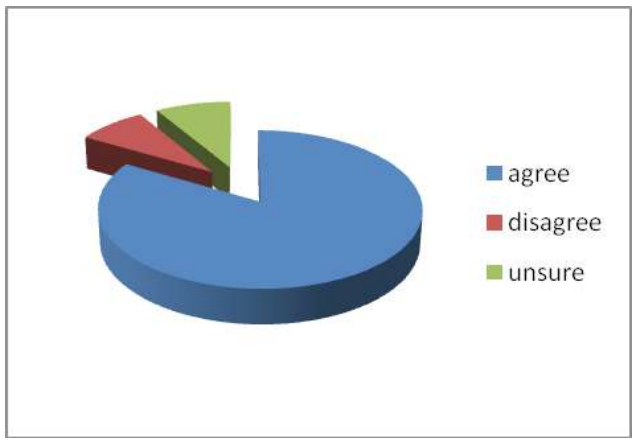

Fig. 3: (Q 2). "The teachers are knowledgeable". (Score-134)

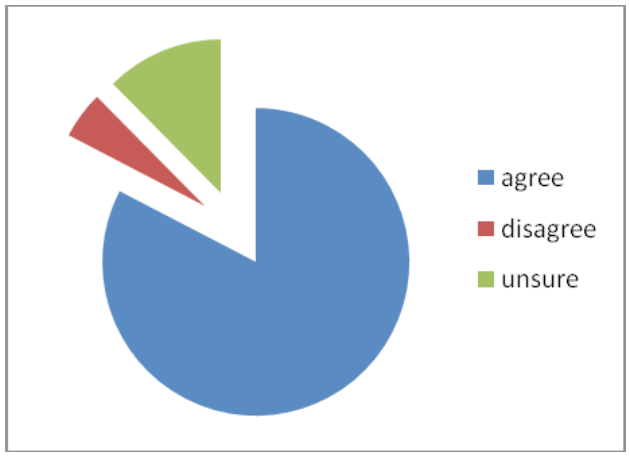

Fig. 4: (Q 10). "I am confident about passing this year". (Score-133)

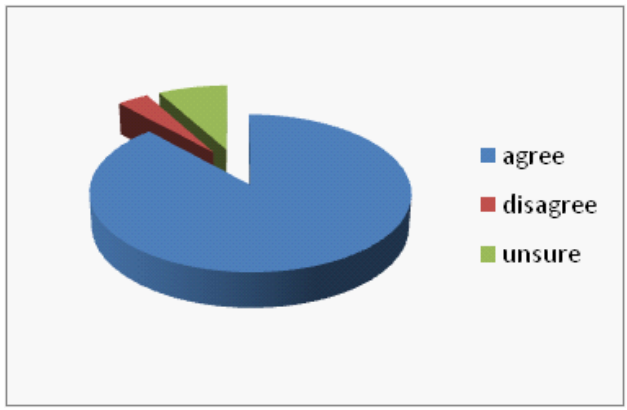

Fig. 5: (Q 18). "The teachers have good communication skills with patients". (Score-142)

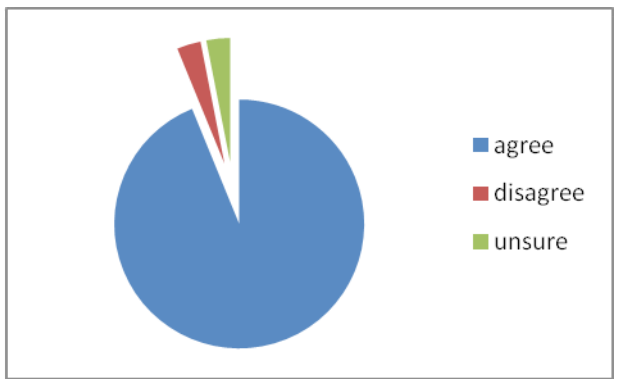

Fig. 6: (Q19). "My social life is good". (Score-151)

Discussion

The primary objective of this survey was to assess the student's perception regarding academic environment of undergraduate physiotherapy students. Academic environmentis the most important factor in student's behaviour, learning, understanding profession and growth[7]. We used DREEM inventory questionnaire

for this purpose. DREEM inventory is a reliable and effective instrument in interpreting the academic environment of various programmes[8]. Present survey was performed in Physiotherapy colleges of North India. In this study, maximum numbers of students perceived the educational environment as positive.

82% students responded that they were actively participating in the class that indicates student's positive perception towards teaching environment. Furthermore, new strategies should be incorporated to enhance the more interest like practical sessions, presentations and live examples. 48% students expressed that the teachers provide good support system for the students under stress while others disagreed with this point. Techniques like Jacobson Relaxation exercises, breathing exercises & regular counseling may be incorporated for effective management of stress. 35% students stated that they are tired to enjoy this course. Therefore,few extra-curricular activities such as sports, annual functions, youth festivals etc should be incorporated for more emphasis. 46% students agreed that the "learning techniques which work for me before continue to work for me now", but 17% students disagreed. Learning strategies should be modified depending upon student's capabilities. Teaching should be simple, understandable and clear. Novel learning strategies should be incorporated such as practical training, case studies, audiovisual aids etc. 12% students expressed that the teaching is not stimulating. Therefore, stimulus should be provided such as open discussion, visual presentations to make teaching more effective. The role of teachers should not be concentrated only on information provider but also a skill facilitator. They should develop attitudes and skills required for professional growth. 22% students believed that the school or institute is not time tabled. A pre-planned timetable and scheduled plan should be established in all departments for better learning. 22.36%students expressed that the teaching is not student-centered while. A revised curriculum should be established for the long term learning of the students and enhance their knowledge and confidence. 44% of participant expressed that the cheating is a main issue in this institute which indicates a serious concern. Therefore, strict rules should be included in the school to avoid cheating such as punishments (physical or mental), fine and suspension etc.

Some students (52%) stated that "there is too much factual learning to memorize" and have reported similar concern. Therefore, teaching should emphasize on long term learning as well as enhancing student's practical knowledge. There should be some holistic knowledge based on values and beliefs.The problem of **"**teacher-centered teaching and factual learning" can be resolved by implementing "Problem Based Learning (PBL) sessions" and "Short-term Student Research Project" which makes students independent. "Personal and Professional Development (PPD) sessions" can also be implemented to reduce tension and stress [9]. The students should be encouraged more towards self-directed learning to raise the confidence of working independently as well as to enhance the student's knowledge, understanding and learning [10].70% of students expressed that "the teaching time is put to good use". This is a good sign that the time is utilized optimally by maximum students. Students should be advised to utilize their time in library, reading room, OPD, and practical room's etc.18% students stated that the teachers not give clear examples. Therefore, simple examples should be given to clear the concept and overcome the doubts.8% students expressed that "they are not clear about the learning objectives of the physiotherapy course". Coordinator should advise to provide clear aims and objectives of the profession i.e.health promotion, health education and improve the quality of life.Almost 60% students agreed that the enjoyment overweighs the stress of study.Excessive stress of the study disturbs their personal life. Therefore, some extracurricular activities and functions should be organized to increase their interest in the profession.88.19% students were satisfied from their education and environment. They perceived their education more positive. Results suggest that educational performance, career and profession can be enhanced by developing or planning effective and efficient strategic techniques and various plans for better understanding, learning and knowledge[11, 12].Although educational environment needs careful ongoing evaluation on regular basis (such as teaching, learning, curriculum etc.) and requires necessary actions and cooperation from both sides (teacher and student). The overall average DREEM score for Indian medical school, Karnataka, was found to be 117/200 (n = 226), indicating that, students' perceptions towards their teaching were more positive[13].The global DREEM scores in other medical institutes such as in Sri Lanka, Nigeria and UK were found to be 108/200 [14], 118/200 [15], and 139/200 [16] respectively. The mean DREEM score for a medical school in India was reported as 107.44/200[17].This survey provides insights to the concerns and standards of Physiotherapy education in

North India. It can be generalized and necessary changes may be incorporated in curriculum as well as teaching and evaluation process to improve the satisfaction levels among the student pursuing Physiotherapy course.

Conclusion

Out of 161 students; 142 students (88.19%) were happy to choose physiotherapy field and 19 students (11.18%) were unhappy. Average score of students was 127. Students pursuing Physiotherapy course in North India are satisfied with the course. However, survey findings can be incorporated by the administration of colleges to further improve the level of satisfaction.

Ethical Approval: Participants were assured about the confidentiality of the study.

Conflict of Interest: The authors report no conflict of interest.

Source of Funding: Self

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Prevalence of Lumbar Lordosis in Middle-Aged Females

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Abstract

Objective: The objective of the study was to find out prevalence of lumbar lordosis in females aged between 35 to 45 years as per their gravida status.

Method: Ethical clearance was obtained from institutional ethical committee. A total of 100 healthy females from Karad with age between the age group of 35-45 years were selected for the assessment of their lumbar lordosis curvature. Individuals with any history of congenital spinal deformities or spinal fracture, surgical procedures related to spine, pregnant females were excluded from the study. Outcome measure used to measure lumbar lordosis was flexible ruler. The lordotic angle was calculated using the trigonometric formula θ=4 arc tan 2 h/L. Demographic data was collected, outcome assessment was recorded and later data was analyzed.

Results: We found that there is significant presence of hyperlordosis in 45% females from this study whereas presence of hypolordosis was 2%. Females with normal curvature of lumbar spine were about 53%. Hyperlordotic females with gravida 1, gravida 2 and gravida 3 showed 35%, 52.83% and 37.03% prevalence of lumbar hyperlordosis, respectively.

Conclusion: The study results concluded that hyperlordosis was extremely significant in middle-aged females with gravida 2 whereas hypolordosis was not much significant in this group.

Keywords: *Lumbar lordosis, hyperlordosis, hypolordosis, flexible ruler, gravida.*

Introduction

Lumbar lordosis is the ventral curvature of the spine formed by wedging of the lumbar vertebrae and intervertebral discs.(1) Normal lumbar lordosis angle ranges from 30º to 45º(7) Lumbar lordosis is a key feature for sagittal plane balance maintenance.(8) The balance of the muscles around the pelvis is a factor affecting the lumbar lordosis. Because of relationship between the sacrum and the pelvis through the spine, any change in the position of the pelvis leads to changes in the arch of the spine, especially the lumbar lordosis.(2)

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Any increase or decrease in lumbar curvature can affect the body balance and cause various anomalies in the lumbar and pelvic regions.(3)

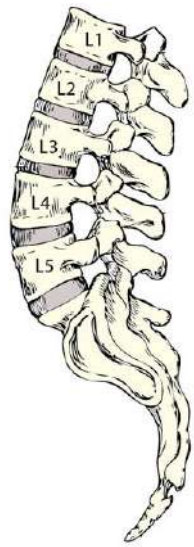

Figure 1: Lumbar Spine and Sacrum

With normal lumbar lordosis, energy expenditure and stress on the supporting structures is minimised when balance is maintained between the lumbar spine and abdominal musculature.

Normally, the abdominal muscles rotate the pelvis posteriorly and, the erector spinae muscles tilt the pelvis anteriorly. Correct muscle activation patterns result in normal compressive and tensile forces occurring at the lumbar spine. There are minimal stresses placed upon the intervertebral disc and the zygapophyseal joints with lumbar spine in neutral position. Hence chances of low back pain are minimal.(4)

In lumbar region, the line of gravity lies slightly posterior which causes extension of lumbar spine. Passive opposing forces are necessary to counteract this extension which are provided by the anterior longitudinal ligament and iliolumbar ligaments as well as, the anterior fibres of the annulus fibrosus of the intervertebral disc and zygapophyseal joint capsules. Active opposing forces are also necessary to counteract extension at the lumbar spine are provided by the abdominal muscles.(5)

Lumbar curvature is of great significance because it carries the upper body weight and transfers it directly to the pelvis. Any increase or decrease in lumbar curvature can affect the body balance and cause various anomalies in the lumbar and pelvic regions. It is believed that the muscles in this area are one of the factors affecting the lumbar-pelvic balance, as well as the performance of lumbar lordosis and pelvic tilt.(9) Also, weakness of abdominal, dorsal, and lumbar muscles has been recognized as the most common factors increasing the lumbar curvature.(8)

Types of Lumbar Lordosis:

Hypolordosis: When the lordotic angle of lumbar spine is less than 30º it is termed as hypolordosis.(7)

In hypolordosis there is over-compression of the intervertebral discs anteriorly with posterior displacement of the nucleus pulposus.

The zygapophyseal joints are in a close-packed position with lumbar spine extension, therefore with a hypolordotic lumbar spine, the zygapophyseal joints are distracted as a result of its anatomical orientation and also due to the decreased load on the zygapophyseal joints posteriorly.(4)

There will be stretching of the lumbar spine extensors and the posterior lumbar spine ligaments whereas shortening of the abdominal muscles and the anterior longitudinal ligament in hypolordotic lumbar spine.(5)

Hyperlordosis: When the lordotic angle of lumbar spine is more than 45º it is termed as hyperlordosis.(7)

In hyperlordosis there is compression of the posterior vertebral bodies and the posterior zygapophyseal joints since they are in a close-packed position, which increases intervertebral disc pressure and narrowing of intervertebral foramina. There is excessive stretching of the anterior longitudinal ligament and abdominal muscles while shortening of lumbar spine extensors, posterior longitudinal ligament, interspinous ligaments and ligamentumflavum.(4)

With a hyperlordotic lumbar spine posture there is impaction of the zygapophyseal joints. The resultant alteration in the spinal biomechanics results in decreased range of motion of the lumbar spine. The inflammation from the dysfunction phase of the degenerated intervertebral disc along with the decreased range of motion results in the hypersensitivity of proprioceptors and nociceptors in the intervertebral disc, ligaments, joint capsules, zygapophyseal joints and nerves. This hypersensitivity initiates a reflexogenic response thereby inducing muscle spasm.(6)

Materials and Methodology

Type of study: observational study, place of study: Karad., sample size: 100study duration: 3 months

Inclusion Criteria: 1) Age group: 35-45 years 2) Female participants irrespective of low back pain.

Exclusion Criteria: 1) Participants with any congenital spinal deformities. 2) Participants with a history or current status of spinal fracture. 3)Participants who had surgical procedures related to spine. 4) Pregnant females. 5)Participants who are physically disabled.

Outcome measures: The spinal assessment specific to lumbar lordosis was done using flexible ruler.

Ethical clearance was obtained from institutional ethics committee. 100 subjects fulfilling the inclusion and exclusion criteria were included. Prior to testing, each subject read and signed an informed consent form.

To examine the lumbar curvature, a flexible ruler was used. To assess the curvature participants were asked to stand in normal anatomical position.

First lumbar (L_1) and second sacral (S_2) vertebrae were considered as markers for evaluating the lumbar lordosis. Then flexible ruler was placed on L_1 and S_2 while a hand pressed on it to eliminate the gap between the ruler and the skin. The ruler was placed on the graph paper and the curve was drawn. Two ends of the curve were joined and a line L was drawn whose midline vertically reached the middle of the curve through the h line. The lengths of h and L lines were calculated and the a forementioned angle was obtained. θ=4 arc tan 2 h/L

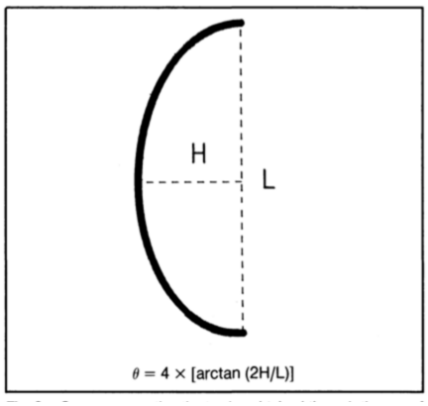

Figure 2: Flexible ruler formula for measuring lumbar lordosis angle

Findings: Distribution according to type of lumbar curvature:

Out of 100 subjects, 2 were having hypolordosis, 53 were having normal lordosis and 45 were having hyperlordosis.

Table 1: Distribution according to type of lumbar curvature

Type	Hypolordosis	Normal	Hyperlordosis
Frequency (Number of subjects)	2	53	45

2% females were having hypolordosis, 53% were having normal lordosis and 45% were having hyperlordosis.

Distribution according to Gravida:

Gravida 1: Out of 100 subjects, 20 subjects with gravida 1, 2 were having hypolordosis, 11 were having normal lordosis and 7 were having hyperlordosis.

Table 2: Distribution for Gravida 1

Type	Hypolordosis	Normal	Hyperlordosis
Frequency (Number of subjects)	2	11	7

With gravida 1, 10% females were having hypolordosis, 55% were having normal lordosis and 35% were having hyperlordosis.

Gravida 2: Out of 100 subjects, 53 subjects with gravida 2, none were having hypolordosis, 25 were having normal lordosis and 28 were having hyperlordosis.

Table 3: Distribution for Gravida 2

Type	Hypolordosis	Normal	Hyperlordosis
Frequency (Number of subjects)	0	25	28

With gravida 2, 0% females were having hypolordosis, 47.16% were having normal lordosis and 52.83% were having hyperlordosis.

Gravida 3: Out of 100 subjects, 27 subjects with gravida 3, none were having hypolordosis, 17 were having normal lordosis and 10 were having hyperlordosis.

Table 4: Distribution for Gravida 3

Type	Hypolordosis	Normal	Hyperlordosis
Frequency (Number of subjects)	0	17	10

With gravida 3, 0% females were having hypolordosis, 62.96% were having normal lordosis and 37.03% were having hyperlordosis.

We found that there is significant presence of hyperlordosis in 45% females from this study. Presence of hypolordosis was not significant from this study.

Females with normal curvature of lumbar spine were about 53%.

Discussion

This study was conducted to find the prevalence of presence of lumbar lordosis in females between the age group of 35- 45 years. Among 100 selected females, hyperlordosis was found significant in 45 females.

Women have more static lumbar sagittal curvature (lordosis) than men and there is no difference in lumbar curvature between those with undifferentiated LBP and those without LBP.

Females with hypolordosis were having lumbar lordosis angle less than 30°. Among 100 females only 2 females were having hypolordosis. This was about 2% of total females.

Females with normal lumbar lordosis were having lumbar lordosis angle ranging between 30°-45°. Among 100 females 53 females were having normal lumbar lordosis. This was about 53% of total females.

Females with hyperlordosis were having lumbar lordosis angle more than 45°. Among 100 females only 45 females were having hyperlordosis. This was about 45% of total females.

Out of 20 females with gravida 1, only 2 were having hypolordosis while 11 were having normal lumbar lordosis and 7 were having hyperlordosis. That is, 10% females were having hypolordosis, 55% were having normal lordosis and 35% were having hyperlordosis.

Out of 53 females with gravida 2, none were having hypolordosis, 25 were having normal lordosis and 28 were having hyperlordosis. That is, 0% females were having hypolordosis, 47.16% were having normal lordosis and 52.83% were having hyperlordosis.

Out of 27 females with gravida 3, none were having hypolordosis, 17 were having normal lordosis and 10 were having hyperlordosis. That is, 0% females were having hypolordosis, 62.96% were having normal lordosis and 37.03% were having hyperlordosis.

There is presence of hyperlordosis in 45% females from this study. Presence of hyperlordosis in middle-aged females with reference to gravida status is as follows-

Gravida 1- 35%, Gravida 2- 52.83% and Gravida 3- 37.03%

Presence of hypolordosis was not significant from this study. In females with gravida 1 only 10% (2 females) presented with hypolordosis.

Females with normal curvature of lumbar spine were about 53%. Presence of normal lumbar lordosis in middle-aged females with reference to gravida status is as follows-

Gravida 1- 55%, Gravida 2- 47.16% and Gravida 3- 62.96%

Conclusion

We found that there is significant presence of hyperlordosis in 45% females from this study whereas presence of hypolordosis was 2% from this study.

Females with normal curvature of lumbar spine were about 53%.

Conflict of Interest: The authors report no conflict of interest in this study.

Source of Funding: This study was funded by Krishna Institute of medical sciences deemed to be university, Karad.

Source of Funding: Self

Ethical Clearance: Ethical Clearance is taken from Institutional Ethics Committee of Krishna Institute of medical sciences deemed to be university, Karad.

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Radiographic Evaluation of Different Combinations of Zinc Oxide as an Obturating Material in Pulpectomy: A Comparative in Vivo Study

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Abstract

Background and Aims: The success of an endodontic treatment depends on various factors and use of an ideal obturating material is one among that.

The aim of this study was to evaluate and compare the radiographic success of different combinations of zinc oxide as an obturating material in pulpectomy of primary mandibular molars at three and six month intervals.

Treatment success or failure was determined by a combination of clinical and radiographic findings at three and six month intervals.

Results: The results at three and six months follow up yielded statistically significant reduction in size of radiolucency, whereas, the resorption rates of the root and the different materials showed no statistical significance.

Conclusions: All the materials used in the study have potential obturating material property, which shows promising results in preserving the tooth in its dental arch.

Keywords: *Pulpectomy, Obturation, Endoflas, Calcium hydroxide, Sodium fluoride, Zinc oxide eugenol.*

Introduction

Dental caries in primary teeth remains a considerable dental health problem. In an irreversibly affected pulp tissue, either due to caries or traumatic injuries, endodontic treatment is considered as the best option. For the success of an endodontic treatment, numerous materials have been tested as an obturating material but none of these possess all the ideal requisite properties required for obturation in primary teeth; especially with regard to the major desirable property of having a rate of resorption matching that of the physiologic root resorption of primary teeth and faster resolution of furcal radiolucency.[1]

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Material and Method

The present in vivo study was carried out in a clinical set up; on a sample of one hundred and five primary mandibular molars of children in the age group between 4-9 years of both the sexes using simple random sampling technique. A written informed consent and assent were obtained after being advised about the nature of the study according to the protocol approved by the Ethics and review committee. Inclusion criteria were healthy, co-operative children without any systemic disease, history of spontaneous pain with deep carious lesion which is tender on percussion, radiolucency

involving pulp with loss of continuity of the lamina dura, radiolucency in inter-radicular not involving permanent tooth bud, adequate bone support and root length, with no radiographically discernible pathological internal or external resorption, without sinus formation and those children who can report back for the recall visits. Teeth with abnormal mobility other than the normal exfoliation were excluded from the study.

A single sitting pulpectomy was carried out in these samples after administration of local anesthesia using 2% lignocaine with 1:80,000 adrenaline, isolation was achieved with rubber dam during the entire procedure. All the carious tooth structure was removed to gain good access to the coronal pulp. Access opening was done with No. 2 and 4 round diamond burs and the overhanging dentin was removed from the roof of the pulp chamber with Endo-Z carbide bur. Extirpation of pulpal debris from the root canals were done using K and H files of sizes 8 and 10 and copious irrigation with normal saline. After working length determination, the canals were prepared with K-files and H-files and enlarged upto size 40. The root canals were then thoroughly irrigated with normal saline and the final wash of the canals was done with 0.2% chlorhexidine solution and then dried with sterile absorbent paper points of 0.04 taper. The root canals were then randomly filled with the respective obturating materials based on their groups either with endoflas [Group 1], or a mixture of zinc oxide powder, calcium hydroxide paste, sodium fluoride [Group 2] and zinc oxide eugenol [Group3], as per the manufacturer's instructions and were obturated with lentulospirals mounted in a slow speed hand piece. The teeth were then finally restored with glass ionomer cement. After the removal of the rubber dam, immediate post operative radiographs were taken to assess the endodontic fill. The patient was recalled after a week for the placement of preformed stainless steel crowns.

Patients were scheduled for routine recall visits at every three and six month intervals. During the follow up visits, radiographic evaluation was done by measuring the difference in size of radiolucency and also the resorption rate of the material with that of the root using Boley's gauge. [2] A blinded examiner was asked to evaluate the changes and the data was recorded.

The data obtained from this study were tabulated and statistically analyzed using Statistical Package for Social Sciences software (SPSS version 18). Intragroup data comparison was done by using Wilcoxan Signed Rank Test and intergroup comparison using Kruskal Wallis Test to find out the statistical significance of the obtained results. P value of <0.05 was considered to be statistically significant.

Findings

Out of the treated 105 samples, 34 samples were obturated with Endoflas [Group 1]; 35 samples with a mixture of zinc oxide powder, calcium hydroxide paste and 10% sodium fluoride solution [Group2] and 36 samples with zinc oxide eugenol [Group 3] and were evaluated after three and six months [Figures 1,2 and 3].

In all the three groups, reduction in size of radiolucency was noticed from preoperative, three and six months which was statistically significant except in Group 2 between three and six months [Table 1].

Intragroup evaluation of size of radiolucency and resorption rate among the three groups after 3 and 6 months [Table 2].

The change in size of radiolucency and resorption rates among the different materials after three and six months was statistically not significant [Table 3].

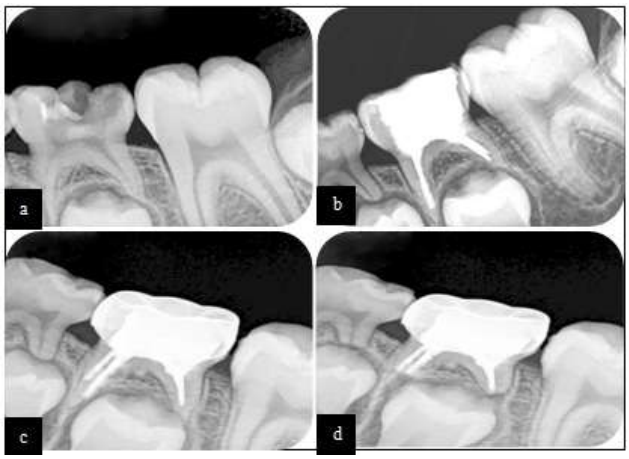

Figure 1: Preoperative and postoperative radiographs of tooth filled with Endoflas:

(a) Preoperative radiograph, (b) Immediate postoperative radiograph, (c) Postoperative radiograph at 3 months, (d) Postoperative radiograph at 6 months

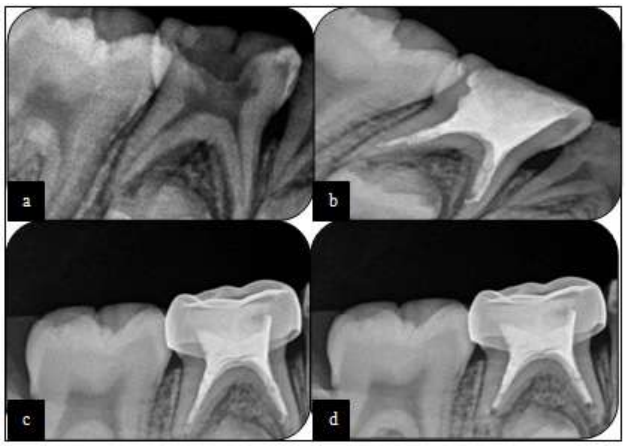

Figure 2: Preoperative and postoperative radiographs of tooth filled with a mixture of zinc oxide powder, calcium hydroxide paste and 10% sodium fluoride solution:

(a) Preoperative radiograph, (b) Immediate postoperative radiograph, (c) Postoperative radiograph at 3 months, (d) Postoperative radiograph at 6 months

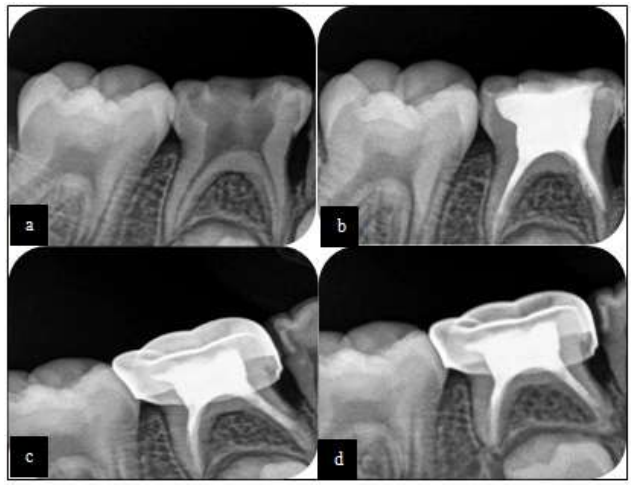

Figure 3: Preoperative and postoperative radiographs of tooth filled with zinc oxide eugenol:

(a) Preoperative radiograph, (b) Immediate postoperative radiograph, (c) Postoperative radiograph at 3 months, (d) Postoperative radiograph at 6 months

Table 1: Intragroup comparison of size of radiolucency among the three groups after 3 and 6 months

Variables	Mean			Standard Deviation			P value		
	Grp1	Grp2	Grp3	Grp1	Grp2	Grp3	Grp1	Grp2	Grp3
Pre-OP	0.36	0.27	0.34	0.658	0.617	0.759	0.003* (S)	0.007* (S)	0.007* (S)
Three Months	0.10	0.08	0.18	0.318	0.289	0.476			
Pre-op	0.36	0.27	0.34	0.658	0.617	0.759	0.003* (S)	0.007* (S)	0. 007* (S)
Six Months	0.01	0.01	0.10	0.086	0.068	0.273			
Three Months	0.10	0.08	0.18	0.318	0.289	0.476	0.041* (S)	0.102 (NS)	0.041* (S)
Six Months	0.01	0.01	0.10	0.086	0.068	0.273			
P≤ 0.05 is significant, NS- Not significant, HS- Highly significant									

Table 2: Evaluation of size of radiolucency and resorption rate among the three groups after 3 and 6 months

Study Group	Time Interval	Size of Radiolucency	Resorption Rate			
			Root>Material	Root<Material	Root=Material	No Resorption
Group 1 (N=34)	Three months	Decrease (n=9)	01	00	00	08
		No radiolucency (n=25)	02	01	01	21
	Six months	Decrease (n=2)	00	01	01	00
		No radiolucency (n=32)	03	03	10	16
Group 2 (N=35)	Three months	Decrease (n=7)	00	01	00	06
		No radiolucency (n=28)	01	06	00	21
	Six months	Decrease (n=1)	00	01	00	00
		No radiolucency (n=34)	03	08	06	17

Study Group	Time Interval	Size of Radiolucency	Resorption Rate			
			Root>Material	Root<Material	Root=Material	No Resorption
Group 3 (N= 36)	Three months	Decrease (n=9)	01	00	00	08
		No radiolucency (n=27)	01	00	00	26
	Six months	Decrease (n=6)	03	00	01	02
		No radiolucency (n=30)	02	00	00	28

Table 3: Intergroup comparison of size of radiolucency and resorption rate between three materials at 3 and 6 month intervals

Variables	Time Interval	Group	N	Mean Rank	P Value
Size of Radiolucency	Three Months	1	34	55.82	0.217 (NS)
		2	35	54.71	
		3	36	48.67	
		Total	105		
	Six Months	1	34	52.04	0.886 (NS)
		2	35	53.60	
		3	36	53.32	
		Total	105		
Rate of Resorption	Three Months	1	34	53.06	0.993 (NS)
		2	35	53.20	
		3	36	52.75	
		Total	105		
	Six Months	1	34	51.16	0.657 (NS)
		2	35	55.79	
		3	36	52.03	
		Total	105		
P ≤ 0.05 is significant, NS- Not significant, HS- Highly significant					

Discussion

A wide variety of materials have been used for obturation of primary teeth with varying success. Among these, the most commonly used is zinc oxide eugenol, sets into a dense mass which irritates periapical tissues,[3] causes necrosis of bone and cementum,[4] resists resorption and has a tendency to be retained even after tooth exfoliation causing deflection of the path of eruption of the succedaneous tooth.[1,2,4,5,6]

Calcium hydroxide is virtually an all purpose medicament in dentistry.[1] Despite its antiseptic and osteoinductive properties, it is not generally preferred in pulp therapy due to fear of internal resorption as its alkaline pH causes metaplasia of undifferentiated mesenchymal cells to odontoclasts leading to resorption.[7] It has a tendency to get depleted from the canals earlier than the physiologic resorption of roots,[1] resulting in a "hollow tube" effect within the canal wherein the unfilled area is permeated with tissue fluid that eventually becomes a site for infection.[8]

A commercially available product- Endoflas, is highly effective against resistant endodontic pathogen, E. Faecalis, so can be used for management of infected primary molars.[9] It is a hydrophilic material, which when used in humid canals, provides a tight seal, biocompatible in nature with antibacterial properties. According to Pandranki J et al,[9] it reduces periapical inflammatory processes and stimulate periapical healing with increased alkaline phosphatase action thus showing excellent healing capabilities and bone regeneration with 95%-100% success rates. When Endoflas was extruded into the dental follicle, it irritates the follicle and causes intense inflammatory reaction resulting in accelerated root resorption. The use of iodoform containing products

raises the safety issue of iodoform being allergic, causing discolouration of teeth and encephalopathy leading to coma.[1]

To overcome the drawbacks of calcium hydroxide and zinc oxide eugenol, a few drops of 10% sodium fluoride solution was added to this mixture in a previous study. It was suggested that this obturating material could leach out fluoride which will be beneficial to the erupting tooth and a reaction product of calcium fluoride was formed that added radiopacity to the material without the addition of another radiopaque material.[1]

The present study was done to evaluate and compare the radiographic success of Endoflas, a mixture of zinc oxide with calcium hydroxide paste & 10% sodium fluoride solution and zinc oxide with eugenol as an obturating material in pulpectomy of primary mandibular molars.

According to Chawla H.S. et al,[1] on obturating with a mixture of zinc oxide powder, calcium hydroxide paste and 10% sodium fluoride solution, a reaction product of calcium fluoride is formed that added radiopacity to the material. In the present study it was noted that, even though the same quantity of ingredients were used for obturation, the radiopacity of the Group 2 mixture in the immediate postoperative radiograph was nearly similar to that of the dentin, making it difficult to appreciate the length of fill of the material in the canals. Hence, it is advisable to add a radiopacifier for optimum evaluation.

In Group 1, all the 34 samples, showed statistically significant reduction in size of radiolucency from preoperative and at 3 and 6 months [Table 1]. Similar to our study, there was 100% reduction in furcation radiolucency with excellent healing capabilities.[10,11] The disparity in the resorption rates noticed in the present study [Table 2], can be attributed to the influence of various factors such as individuals body resistance;[9] preoperative pathologic condition[12] and periapical pathology.[9]

In Group 2, all the 35 samples showed statistically significant reduction in size of radiolucency from preoperative to 3 and 6 months interval but not between 3 and 6 months [Table 1]. This result suggests that maximum resolution of the radiolucency occurs within the first 3 months and the resolution rate lessens by the end of 6 months. Similar to our study, complete obliteration of the radiolucent area and regaining of normal bony trabecular pattern was noticed by about 4 to 6 months.[13] On evaluating the resorption rates [Table2], Chawla et al,[1] reported that the resorption of the material matched the physiologic root resorption at the end of two years which is contrary to our study.

In Group 3, all the 36 samples showed statistically significant difference in size of radiolucency from preoperative, 3 and 6 months and also between 3 and 6 months [Table 1]. Radiolucency was noticed in 9 samples preoperatively which showed decrease in its size at the end of 3 months and only 3 samples among them showed complete resolution at the end of 6 months [Table 2]. Similar to our study Pandranki et al,[9] and Rewal,[14] showed only 45% reduction in size of radiolucency with pre existing pathosis at the end of 9 months. On evaluating the resorption rates [Table 2], similar to our study, Barr et al,[5] Chawla et al,[1,13] Dogra S [7] and Pandranki [9] showed delay in resorption of zinc oxide eugenol to that of the root and contrary to our study, Nadkarni and Damle,[15] and Coll,[16] reported 88.5% and 86.1% success respectively.

There was no statistical significant difference on comparing the size of radiolucency and the resorption rates of the three materials with that of the root at the end of 3 and 6 months [Table 3].

Conclusion

Although the results did not show any statistically significant difference, the success rate of all these materials are quite promising in reduction of the infection rate and can be considered as a valuable material for obturating deep carious tooth. However, a longer follow up period with sufficient sample size is necessary to reach sound conclusions regarding their resorption rates, effect on the succedaneous tooth and the overall radiographic success as an obturating material in primary teeth.

Ethical clearance- All the clinical procedures were carried out following the protocols approved by the Ethics and Review Committee of Sri Siddhartha Dental College and Hospital, Tumkur (IEC 11/2016).

Conflict of Interest: None.

Source of Funding: Self.

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Development of "Young Planning Clinic" Program as a Prevention Early in Adolescent Attitude in Martapura River Areas

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Abstract

The highest percentage of early marriage events for the last 3 years in girls <20 years old is found in Banjar Regency. In 2015 the percentage of early marriages reached 17.36% and in 2016 the percentage of early marriages in Banjar only slightly decreased to 16.47% while in 2017 early marriages in Banjar Regency in girls experienced an increase in cases with a percentage of 17.51% . The general purpose of this study is to explain the "Klinik Dana" Program as an Prevention of early marriage events in adolescents. The design of this study is analytical, with quasy experimental approach. The research subjects were teenagers at Banjar Regency. The number of subjects targeted for the activity was 62 teenagers. In this study, the research instruments were used as follows, questionnaire sheets, knowledge, attitudes and support for adolescent environments before and after the implementation of the program. The independent variable in this study is the development of the young clinic planning, while the dependent variable is the knowledge, attitudes and environment of adolescents. The results showed that before the intervention was obtained less knowledge of 45 respondents (72.6%), negative attitudes of 11 respondents (17.8%), and the environment did not support 3 respondents (4.9%). While the results in the second month obtained good knowledge of 9 respondents (14.5), negative attitudes of 1 respondent (1.6%), environment did not support 3 respondents (4.83%). At the final value, the results of the lack of knowledge are 1 respondent (1.6%), negative attitude 0% and environment that does not support 0%.This activity is proven to be able to increase knowledge, attitudes, and environmental support for the ideal age marriage. So that the Health Office and Puskesmas can apply this concept in an effort to reduce the rate of early marriage.

Keywords: *Early-age marriage, young clinic planning.*

Introduction

According to the National Coordinating and Family Planning Agency, the ideal age for marriage to women is at least 21 years and to men at least 25 years because at that age the female reproductive organs are psychologically well developed and strong and ready to give birth as well as men Men at the age of 25 will be ready to support their family life. Based on data from the United Nations Children's Fund (UNICEF) 2016 every year around 15 million girls in the world marry before the age of 18. One out of every seven girls in Indonesia is married before the age of 18. Indonesia is one of ten countries with the highest absolute number of child brides, namely 1,408,000 women aged 20 to 24 years have been married before the age of 18 (UNICEF, 2016). In Indonesia, in 2015 the Province of South Kalimantan was the second largest province of cases of early marriage with a percentage of 9% after Central Java (52.1%).

One regency in South Kalimantan which is located in the area of the river is Banjar Regency with the main river is the Martapura River. The Martapura River is the largest tributary in Banjarmasin. One of the social problems in Banjar Regency is the highest percentage of early marriages for the last 3 years in girls <20 years old in Banjar Regency. In 2015 the percentage of early

marriages reached 17.36% and in 2016 the percentage of early marriages in Banjar only slightly decreased to 16.47% while in 2017 early marriages in Banjar Regency in girls experienced an increase in cases with a percentage of 17.51% . Based on data from the Ministry of Religion, Kabupaten Banjar, Martapura Kota, was ranked first with girls who were married with age <20 years which reached 241 cases from 1489 marriages (16.19%) in 2015, 167 cases from 1173 marriages (14.24%) in 2016, and in 2017 that is equal to 237 cases from 1410 marriages (17.81%).

One solution that can be used to provide information and as a preventive effort for early marriage is the embodiment of the "Young Planning Clinic (Dana)" which can be used as a forum for adolescents and parents of adolescents to be given Communication, Information and Education (IEC) regarding generation planning in particular early marriage with the formation of "HIMUNG (Hope and Impian Menuntung) Cadres" and PIK-R (Information and Counseling - Youth Centers). This program is conceptualized in such a way that it fits the attractiveness of adolescents (Qiao, 2012).

Materials and Method

The design of this study is analytical, with the Quasy Experimental approach, which aims to determine the effectiveness of the "Clinic Fund" as an Prevention of Early Marriage Events in Adolescents in the Martapura River. In field research, it usually uses quasi-experimental designs (quasi-experiments). The independent variable in this study is the development of the Fund Clinic, while the dependent variable is the knowledge, attitudes and behavior of adolescents in an effort to prevent the occurrence of early marriage[1].

The research subjects were teenagers who were on the riverbank of the Banjar Regency. The number of subjects targeted for the activity was 62 adolescents. The criteria of the counselor in this study were students of the Public Health Study Program at the Faculty of Medicine, Lambung Mangkurat University who had positive knowledge, attitudes and behaviors about the prevention of early marriage. The number of counselors involved was 6 people with a ratio of 1 cadre to 15 young women.

In this study, the research instrument was used as follows, the questionnaire sheet was the knowledge, attitudes and behavior of adolescents before and after the implementation of the program. Program are made in percentage form with the Wilxon Test to see differences after and before program development. In addition, it was also seen an increase in value every week to see the success of the fund clinical program.

Result and Discussion

1. Univariate Analysis

Table 1 shows the distribution of variables according to categories that are likely related to the incidence of osteopenia in respondents.

Table 1. Frequency distribution of respondent and family characteristics

Variabel	Frequency (Person)	Percentage (%)
Knowledge		
a. Less	45	72,6
b. Well	17	27,4
Attitude		
a. Negatif	11	17,8
b. Positif	51	82,2
Environment		
a. Not Supported	3	4,9
b. Supported	59	95,1

Based on table 1 What is known is that students who are respondents in large numbers are still lacking in the amount of 45 respondents (72.6%). Knowledge used relates to age calculations, planning generation goals programs, restrictions on early marriage, factors that influence marriage events, behavior from marriage, family functions, children's rights, and also about maturation of marriage time. Of the 45 respondents, most of them still could not find out about the Genre program, which was as much as 95.5%, unknown about the minimum price of a married woman that is equal to 84.4%, unknown predisposing factors for a person's behavior were 91.1% can not know about the initial action: as much as 88.8%, the abnormalities produced before early as much as 75%.

The results of the study found that the majority of respondents had a positive attitude towards early sensitivity, namely 51 respondents (82.2%). Nevertheless, there are still 11 respondents (17.8%) who have a negative attitude.

The results of the study found that most respondents had a supportive environment for marriage with an ideal value of 59 respondents (95.1%). Nevertheless, there are

still 3 respondents with the assumption that they do not support the ideal day money. The environment used in this environment is ideal. The environment that is not supportive of marriage during ideal periods because of being pregnant in a young place is common in the respondent's place, which is 56.4%. Nationally can be seen by 8% of women 10-59 years of birth 5-6 children, and 3% of children over 7. An ideal woman is pregnant at the age of 20-35 years. The impact that will arise in pregnancy at an early time is maternal death. Based on the 2012 IDHS data, the Maternal Mortality Rate (MMR) is estimated at 359 per 100,000 live births.

2. Bivariate Analysis

Table 2. pre-test and post-test result

Category	P-Value	Information
First Month		
Knowledge	0,0001	Significant
Attitude	0,047	Significant
Environmet	0,002	Significant
Second Month		
Knowledge	0,008	Significant
Attitude	0,0001	Significant
Environmet	0,004	Significant
Third Month		
Knowledge	0,996	not significant
Attitude	0,144	not significant
Environmet	0,851	not significant

*p-value (<0,05)

Table 2 using the Wilcoxon test. Based on the table it is known that the activities in the first month showed significant results between before the implementation of the Fund Clinic with after the implementation of the Dana Clinic with a value of p = 0,0001 (<α) for knowledge so that the results showed a significant change. This increase in knowledge is due to the fact that previously students did not know about the genre program and the impact of early marriage became aware of these things. Through the Clinic program this Fund will be delivered in relation to the genre program and matters relating to early marriage. So the students who became respondents became more aware of this.

The results showed that the attitude of students between before the implementation of the Dana Clinic and after the implementation of the Dana Clinic showed significant results with a value of p = 0.047 (<α). Based on preliminary data there are 17.8% who still have a non-supportive attitude towards the ideal marriage age. After conducting the Dana Clinic program in the first stage, some students, namely 63.6% of 11 female students, changed their attitudes to support the marriage with an ideal age.

The results showed that the environmental variables showed that there was a significant change between before the implementation of the Fund Clinic and after the implementation of the Dana Clinic with a value of p = 0.002 (<α). Counseling is one form of health promotion that is simple and can cover broad goals. One of the initial outcomes of counseling activities was increasing knowledge[2].

Table 2 shows that the activities in the second month showed significant results between before and after the implementation of the Dana Clinic with a value of p = 0.008 (<α) for knowledge so that the results showed significant changes. The change was caused by an increase in the number of female students whose knowledge was good, namely from 17 female students (27.4%) to 53 respondents (85.4%) or 58% increase in knowledge. As for the student's attitude, it shows significant results also with a value of p = 0,0001 (<α). There was an increase in attitude change from 51 respondents (82.2%) to 59 respondents (95.1%) or increased by 12.9%. Whereas in the environmental variable the results show that there is a significant change between before and a myriad of activities with a value of p = 0.004 (<α). The significance of this change is due to an increase in the supporting environment, from the initial 59 respondents (95.1%) who had a positive environment to 61 respondents (98.3%). In the results of this second month, it can be concluded that intervention activities can improve knowledge to be better, change attitudes that are still negative to be positive with significant test results and from environments that do not support being supportive of marriage at the ideal age.

Table 2 shows that activities in the third month showed insignificant results before before the implementation of the Fund Clinic with after the implementation of the Dana Clinic with p = 0.996 (<α) for knowledge so that the results showed no significant changes. This is due to an increase in the number of female students whose good knowledge is not too much, namely from 53 female students (85.4%) to 55 respondents (88.7%) or an increase in knowledge as much as 3.3%. So that the increase in student knowledge does not look significant. The student's attitude showed a non-significant result

with p = 0.144 (<α). Changes in student attitudes after the Fund Clinic activities in the Third Month did not change drastically, ie from 59 respondents (95.1%) to 62 respondents (100%). The environment shows that there is no significant change between before and after the activity with a value of p = 0.851 (<α). Changes that occur are not significant, namely from the initial 61 respondents (98.3%) who have a positive environment to 62 respondents (100%). In the results of this third month all variables did not experience significant changes. This is because the knowledge, attitude, and environment of the respondents who have improved after intervention in the first and second months[4].

3. Final Results After Intervention for 3 Months

Table 3. Knowledge, Attitude and Environment After 3 Months of Intervention

Category	Frequency (Person)	Percentage (%)
Knowledge		
a. Less	7	11,3
b. Well	55	88,7
Attitude		
a. Negatif	0	0
b. Positif	62	100
Environment		
a. Not Support	0	0
b. Support	62	100

Based on table 3, it is known that the knowledge of adolescent students who become respondents is mostly good, that is equal to 55 respondents (88.7%). Good knowledge will shape and influence a person's mindset, then the mindset will form a positive attitude. The impact caused by early marriage is generally more experienced by women5. The results showed that the majority of respondents had a positive attitude towards early marriage in the amount of 62 respondents (100%). Besides knowledge, another factor that is also related to the incidence of early marriage is the attitude towards early marriage. According to Azwar (2009) the factors that influence attitudes are personal experiences where what has been and is being experienced will shape and influence one's appreciation of social stimulus and then form positive or negative attitudes. Other factors that influence the formation of attitudes are emotional. In addition there are mass media factors that can influence the formation of attitudes[6].

Based on table 3, it is known that most respondents have an environment that supports the marriage of the ideal age, which is equal to 52 respondents (83.9%). Environment is one of the factors associated with the incidence of early marriage. According to Puspitasari (2006), adding that the traditional factor of early age marriage is due to parents' fear of gossip from close neighbors, parents feel afraid that their children are said to be spinsters. Early marriage behavior is an operant behavior that is learned by adolescents from the environment where the individual lives. This is related to early marriage behavior which is influenced by the surrounding environment. The environmental influences referred to in this study are the existence of values and norms that develop in the community related to the existence of a young woman and the concept of marriage. The influence of the environment in this study was calculated through the level of adolescent's confidence in the norms and developing values[7].

4. Difference Test Analysis

Table 5. The Differences of Knowledge, Atittude, and Enviroment (before and after intervention)

Variable	P-Value
Knowledge	0,001
Attitude	0,0001
Environment	0,009

Table 4 using the Wilcoxon test. Based on the information, it is known that from the first, the results of the activity that have significant results before the activity and after counseling with a value of p = 0.001 (<α) for knowledge so that the results show there are significant changes . The student's attitude shows significant results also with a value of p = 0,0001 (<α). In the environment variable shows the results that there is a significant change between before and after the activity with a value of p = 0.009 (<α).

Conclusions

The knowledge of teenagers who become respondents is still largely lacking, amounting to 45 respondents (72.6%). Most of the respondents had neutral attitudes towards early marriage, which amounted to 51 respondents (82.2%). The knowledge variable shows that there is a significant change between before and after the activity with a value of p = 0.001. The attitude variable shows significant results between the first month to the third month with a value of p = 0,0001 (<α). In the environment variable shows the results that there is a significant change between before and after the activity with a value of p = 0.009 (<α).

Ethical Clearance: This study has received ethical approval from the Research Ethics Committee of the Faculty of Medicine, Lambung Mangkurat University, Banjarmasin, Indonesia. In this study, we used guidelines from the Public Health Ethics Committee, including title research, informed consent, research objectives, data rights obtained and also the signature of researchers and respondents. chairman.

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Conflict of Interest: The authors declare that they have no confict interest.

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Patterns and Determinants of Utilization of Healthcarein Urban Field Practice Area of a Tertiary Care Institute, Hyderabad

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Abstract

Introduction: It is estimated that 68% of the World's population shall live in urban areas by 2050; India will have added 416 million to the urban population. With rapid increase in population, the healthcare needs also increase. In 2016, 63% of the deaths were due to non-communicable diseases and 26% due to communicable diseases. India is a country with high level of morbidity. Communicable diseases contribute to the morbidity more than the non-communicable diseases. Despite the increasing public and private expenditure on healthcare, utilization of health services still remain low. The utilization of public health services in India range from 10-30%.

Aim and Objective: To study the Patterns and Determinants of Utilization of Healthcare.

Materials and Method: A cross-sectional study was conducted among 256 attendees of a health camp conducted in urban field practice area, using a predesigned and pretested questionnaire. Data entered into Microsoft excel and analysed using SPSS 20.

Results: The overall population of the area was 7634, 2256 were attended the camp giving a 30% utilisation. Out of 256 patients 40.6% were males and 59.4% were females. 25.7% Respiratory, 12.9% musculoskeletal and 11.7% gastrointestinal problems were common. It was found that the behavioural determinants of subjects utilising healthcare facilities both in public and private sector showed that free services was observed as main factor for approaching public healthcare against reliability. Whereas less waiting time was the principal factor compared to cleanliness for visiting private healthcare.

Conclusion: In the study population, Respiratory problems were found to be highest, private healthcare facility was preferred.

Keywords: *Utilization, determinants, urban Healthcare.*

Introduction

It is estimated that 68% of the World's population shalllive in urban areas by 2050 and India will have added 416 million to the urban population[1]. With rapid increase in population, the healthcare needs also increase. Indian scenario in 2016, 63% of the deaths were due to non-communicable diseases and 26% due to communicable diseases[2]. India is a country with high level of morbidity. Communicable diseases contribute to the morbidity more than the non-communicable diseases. With the concept of universal health coverage at every sector, there seems to be a changein the burden of healthcare cost with utilization[3]. The twelfth five year plan document noted disparities in access to healthcare

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services in urban setup[4]. Health being a highly personal responsibility and major public concern takes a backseat when it comes to approaching it, spending from one's own pocket, in a country like India where resources are limited[5]. With increasing population and rapid urbanisation it is of importance that the private sector alongside public sector provides healthcare facilities to the expanding population[6]. At the end, out of pocket expenditure elimination happens to be a corner stone to achieving urban health care. This may seem possible through camp approach to increase coverage and awareness[7].

Despite the increasing public and private expenditure on healthcare, utilization of health services still remain low. The utilization of public health services in India range from 10-30%.Bare provision of primary healthcare facility, its utilization is a major concern added to its access. Doorstep provision of services in the form of Mega Health camps, also suffer some component of underutilization. This needs to be further studied as to understand the factors responsible for the behavioural pattern and scepticism prevalent among the community. There also is variability in the community with regard to demands of basic healthcare services which needs to be addressed at the time of planning stage. Against this backdrop and dearth of knowledge, the study was conducted with the aim of studying the Patterns and Determinants of Utilization of Healthcare in this area.

Materials and Method

A Cross-sectional study was conducted in the urban field practice area of a tertiary care institute in Hyderabad, Telangana during period from August-September 2018. Participants were selected from the attendees of camp by simple random sampling. Study tool consisted of predesigned, pretested questionnaire administered through personal interviews. A clinical examination of the individuals was done and appropriate treatment was provided to the needful. Questionnaire consisted of socio-demographic details, present and past illness, reasons and duration of illness for approaching healthcare, expenditure on healthcare, awareness regarding local healthcare facilities and schemes. A sample size of 256 was calculated using the formula $4pq/d^2$(p=20%, q=80%, absolute error of 5%). Persons more than 18 years of age, co-operative, who gave consent, were included in the study. Data was entered in Microsoft Excel and was analysed using SPSS version 20 and presented as frequency tables and graphs, appropriate tests of significance were applied.

Results

The overall population of the area was 7634, from which 2256 attended the camp, resulting in 30% utilization of healthcare. Data was collected from about 10% of the attendees who were interviewed and adjusted to meet the sample size which was equal to the estimate population given by the formula. It is seen that the most common age group is 18-45 years which constituted 49.6%. Among the study participants 41% were non educated, majority (45.4%) were females. Most of them belonged to class III socio-economic status. Alcohol consumption was seen in 5.5%, any form of tobacco consumption was found in 35.9%.

As seen in **Table 1**, top three common illnesses were Respiratory (25.8%), followed by musculoskeletal (12.9%) and lastly gastrointestinal (11.7%). These were more found among the females as compared to the males. This pattern may be due to the availability of the population during the services provided to them.

As in **Table 2** it was found that the behavioural determinants of subjects utilising healthcare facilities both in public and private sector showed that free services was observed as main factor for approaching public healthcare against reliability. Whereas less waiting time was the principal factor compared to cleanliness for visiting private healthcare. Odds ratio of the above two scenarios was found to be statistically significant.

Table 1: Disease pattern among the subjects

Diseases	Male n=104(40.6%)	Female n=152(59.4%)	Total N=256 (100%)
Diabetes	3(2.9)	19(12.5)	22 (8.6)
Hypertension	6 (5.8)	13 (8.6)	19 (7.4)
Respiratory	33 (31.7)	33 (21.7)	66 (25.8)
Musculoskeletal	8 (7.7)	25 (16.4)	33 (12.9)
Skin	8 (7.7)	10 (6.6)	18 (7)

Diseases	Male n=104(40.6%)	Female n=152(59.4%)	Total N=256 (100%)
Ocular	16 (15.4)	7 (4.6)	23 (9)
ENT	10 (9.6)	15 (9.9)	25 (9.8)
Genitourinary	2 (1.9)	18 (11.8)	20 (7.8)
Gastrointestinal	18 (17.3)	12 (7.9)	30 (11.7)

Table 2: Behavioural determinants of subjects for utilising healthcare facilities

Variable#	Male (n=104) 40.6%	Female (n=152) 59.4%	Total (N=256) 100%	Odds ratio (95% CI)
Public Healthcare	34 (32.7)	36 (23.7)	70 (27.3)	
Free Services*	28 (82.3)	19 (52.8)	47 (67.1)	4.4 (1.06–18.49)
Reliability	3 (8.8)	9 (25)	14 (20)	1
Availability of Doctors	2 (6)	5 (13.9)	5 (7.1)	
Others	1 (2.9)	3 (8.3)	4 (5.7)	
Private Healthcare	58 (55.8)	93 (61.2)	151 (59)	
Cleanliness	16 (27.6)	11 (11.8)	27 (17.9)	1
Less Waiting Time*	21 (36.2)	42 (45.2)	63 (41.7)	2.9 (1.15 -7.37)
Near to Residence	14 (24.1)	28 (30.1)	42 (27.8)	
Others	7 (12.1)	12 (12.9)	19 (12.6)	
Both	12 (11.5)	23 (15.1)	35 (13.7)	

Multiple response to variables * p value < 0.05 were taken as significant

Discussion

The distribution of study population was similar to studies conducted across India[4-7] where 49.6% were in the age group 18-45 years. As compared with literacy status our study showed a high illiterate population which was similarly found by other investigators in their studies[3-7]. In our study 56.2% belonged to class III socioeconomic status, whereas Gaiki et al found it to be 19.07%[3]. In a study by Mihir et al 50.6% of men consumed tobacco in various forms which was found similar to our study 51.6%, however 7.39% men consumed alcohol when compared to our study it was found to be almost double(13.5%). Similarly 23.5% of the females used tobacco (various forms) compared to our study, it was found to be 25%, alcohol consumption was found to be 0.8% in females, and in our study none of the females had the habit of alcohol consumption[8].

Common diseases which were found in our study coincided with other studies such as done by Shaikh et al genitourinary diseases (16%) and digestive diseases (12%) were found in males and genitourinary diseases 18% and digestive diseases (12%) in females[9]. Whereas in our study genitourinary diseases (2%) and digestive diseases (17.3%) was seen in males and genitourinary diseases (11.8%) and digestive diseases (7.9%) was seen in females.

Respiratory illness, diabetes and hypertension were found to be 38%, 22.5% and 23.5% in a study done by Patil et al compared to our study it was found to be 25.8%, 8.6% and 7.4% respectively[10].

In another study done by Datta et al, majority of the illnesses was contributed by respiratory, musculoskeletal and non-communicable diseases, which were 31.1%, 17.8% and 13.7% respectively compared to our study it was found to be 25.8%, 12.9% and 16% respectively[11].

67.15% visited private health facility by Shukla et al, whereas 59% utilised only private health facility and 13.7% utilised both public and private healthcare facility in the present study[5].

In a study done by Kumar et al, 40.25% of men and 46.34% of female utilised public health facility, 59.5% men and 53.66% females utilised private healthcare facility, whereas in our study 32.7% of men and 23.7% of female utilised only public health facility, 55.8% men and 61.2% females utilised only private healthcare facility[12].

Overall 59.15% utilised private healthcare and 33.8% utilised public healthcare in a study done by Kumar et al which was found similar to our study 59% utilised private healthcare and 27.3% utilised public healthcare[13].

In a study done by Shukla et al free services (64.79%) was found to be the major reason for opting public health facility in rural areas which was found similar (67.1%) to urban setup of our study[6].

Reliability (31.5%) and availability of staff (12.75%) influenced utilisation of public healthcare facilities according to a study done by Patil et al whereas our study found reliability (20%) and availability (7.1%) contribution to availing public healthcare facilities[10].

The main factors behind non utilization of public health care in urban setup were waiting time (56.6%),cleanliness (7.14%) and distance (27.2%) according to a study done by Shukla et al which was found to be similar to our study, 41.7%, 17.9% and 27.8% respectively[5].

Conclusion

This study therefore concludes that when facilities are provided for their effective utilization one must keep in mind the cleanliness and waiting time and the management of the crowd in a desirable manner. Not-withstanding the services must also be affordable/free to them for them to be effectively utilized.

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Awareness & Practice of Road Safety Measures among Under Graduate Medical Students of a Medical College in Bengaluru, Karnataka

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Abstract

Background: Road traffic accidents are considered as one of the important public health problems around the world. Data from India showed that more than 1.3 lakh people died on Indian roads, giving India the dubious honor of topping the global list of fatalities from road crashes. Rapid urbanization, motorization, lack of appropriate road engineering, poor awareness levels, nonexistent injury prevention programmes, and poor enforcement of traffic laws has exacerbated the situation.

Method: This cross sectional study was conducted among the undergraduate medical students from 1st to 9th term. Data was collected using a semi structured questionnaire by interview method. Convenient sampling was done. A sample size of 260 was calculated assuming the awareness levels among medical students as 50%, a relative precision of 6% and confidence level of 95%.

Results: The overall awareness levels among the study participants regarding road safety measures are good. More than 90% students were aware of the basic safety measures like regular use of seat belts, distraction caused by loud music and speed limitations. In the present study only 4 students (1.5%) have admitted being involved in drunken driving.

Keywords: *Road traffic accidents, awareness, medical students, cross sectional studies.*

Introduction

A road traffic accident (RTA) is any injury due to crashes originating from, terminating with or involving a vehicle partially or fully on a public road. It is projected that road traffic injuries will move up to the third position by the year 2020 among leading causes of the global disease burden. They are considerable economic losses to victims, their families, and to countries as a whole.[2]

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The UN general assembly has declared 2011-2020 as the "Decade of Action for Road Safety".[1]

The declaration holds significance because road traffic accidents (RTAs) have become a major cause of morbidity and mortality, especially among the adults and middle aged individuals who constitute economically most productive age groups of society.[1]

Road traffic accidents (RTAs) are considered as one of the important public health problems around the world.

Data from India showed that more than 1.3 lakh people died on Indian roads, giving India the dubious honor of topping the global list of fatalities from road crashes.[2]

Rather than mechanical, its human factor that

contribute significantly to increasing number of road accidents in India.[2]

According to a report published by Ministry of Road Transport and Highways, 56 accidents occur every hour on Indian roads and at least 14 people are killed in these accidents. Prevention of RTAs thus, becomes very crucial in order to improve the longevity and the quality of life of the individuals' concerned.[1]

Simple measures like being aware of various traffic rules & regulations and practice of road safety measures can effectively reduce the impact of RTAs. There were few studies in relation to road safety measures among young adults across India and abroad.

Objectives:

1. To assess the awareness among undergraduate students regarding road safety measures.
2. To measure the road safety practices of the students.

Methodology

This cross sectional study was conducted among the undergraduate medical students from 1st to 9th term over a period of 2 months (August 2018-September 2018). Data was collected using a semi structured questionnaire by interview method. Convenient sampling was done. A sample size of 260 was calculated assuming the awareness levels among medical students as 50%, a relative precision of 6% and confidence level of 95%. Ethical clearance was obtained from the institutional ethical committee. The students with a valid driving license who gave consent were included in the study.

Results

Mean age group of the study participants was 19.9 years with a standard deviation of 1.52.

Majority of the participants were females–155 (59.6%) and males were 105 (40.4%).

Awareness of Road Safety Measures: Majority of the participants were aware of the fact that drunken driving is dangerous (99.3%) and 4 students have admitted being involved in drunken driving (Fig 1).

Most of the participants were aware of the safe use of newer technological assistance systems like navigation & Bluetooth hands free devices.

An alarming finding is the lack of knowledge on lane discipline taking into consideration the fact that all participants were valid driving license holders. 49 students (18.8%) did not know the correct lane that should be followed while driving/riding in India.

48 students (18.5%) did not know the correct lane for overtaking. We must keep in mind that a majority of accidents happen as a result of improper overtaking maneuvers.

Table 1. Awareness levels among participants (who responded in affirmative) regarding road safety measures

Sl.No.	Road Safety Measures	Total in%
1	Driving after consuming alcohol is dangerous	99.3
2	Cautious driving near schools	99.6
3	Safe time to read maps is when your vehicle is parked	98.5
4	Seat belts should be worn by everyone in the car	91.6
5	Loud music in the car can distract the driver	87.0
6	One should drive in the left lane	81.2
7	One should overtake from the right hand lane only	81.5
8	One should pull over when it is safe to give way to an ambulance	99.2
9	Safest way to use mobile phone while driving is hands free device	97.3
10	One should wait patiently if pedestrians are taking too much time at zebra crossings	89.2
11	Correct knowledge about speed limits is essential	98.5

Practice of Road Safety Measures:

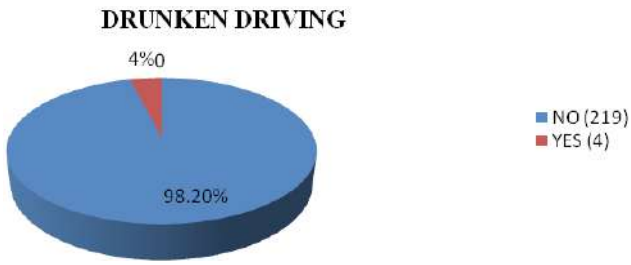

Fig 1. Pie chart showing that majority of students avoid drunken driving

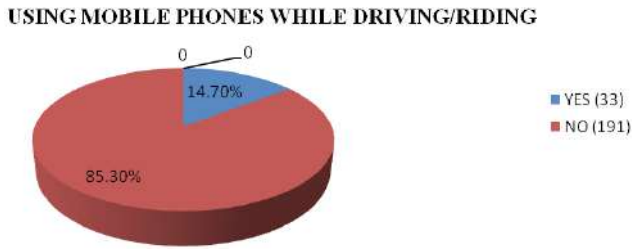

Fig 2. Pie chart showing use of mobile phones while driving/riding

Even though 98.5% of students were aware that knowledge of speed limits is essential, 36.5% of participants have admitted to exceeding the same on roads.

It is also of concern that 14.7% that is, 33 students have admitted using mobile phones while driving/riding including texting, which is a very dangerous behavior (Fig 2). 15% of participants never use helmets regularly & 13.5% use helmets only because of the fear of being fined by the authorities.

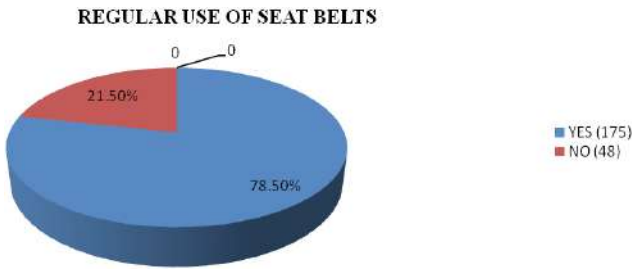

Fig 3. Pie chart showing regular seat belt use among the study participants

Wearing a seat belt may at times be the only difference between life & death during an RTA. 78.5% of participants are regular seat belt users & 91.6% of them are aware that seat belts must be worn by every occupant in a vehicle (Fig.3).

Discussion

The overall awareness levels among the study participants regarding road safety measures is good which is in contrast to a study done by Kulkarni et al in 2012, which revealed very low awareness levels among medical students.[1]

This difference may be due to the fact that there has been an increase in use of social media since the past few years which might have contributed to better awareness of students regarding road safety measures.

More than 90% students were aware of the basic safety measures like regular use of seat belts, distraction caused by loud music and speed limitations.

In the present study only 4 students (1.5%) have admitted been involved in drunken driving which is in contrast to the study done by Kulkarni et al in 2012 in which 54 students (25.4%) have admitted being involved in drunken driving.[1]

This is a positive finding and throws light on the fact that more and more people are aware of risky behaviors on the road & are consciously avoiding the same.

Conclusion

In our efforts to curb the epidemic of road traffic accidents, undertaking proper road safety measures are the best available interventions. The present study revealed good awareness and practice, but there are areas where these should improve and it should be our unending efforts to ensure 100% awareness and practice of road safety measures.

The efforts of increasing road safety measures through sign boards, posters & mass media should be strengthened to reduce the morbidity & mortality in relation to road traffic accidents.

Recommendations:

- Improve the pre-licensure training. Licensing should be made stricter.
- Frequent re-enforcement of traffic rules through mass media and trainings at educational institutions.
- Traffic rule violations should be dealt with more seriously and people should be made aware of all punishable offences.

Conflict of Interests: None

Source of Funding: None

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The Effect of Eye-Hand Coordination Device on Coordination in Subjects with in-Coordination

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Abstract

Coordination or coordinated movement is the ability to execute smooth, accurate, controlled motor responses. The ability to produce these motor responses is a complex process dependent on a fully intact neuromuscular system. Nowadays there are Fewer Devices Which can help in Gaining Eye-Hand Coordination. Objectives: To compare the effect of eye-hand coordination device and conventional Physiotherapy in eye-hand coordination for subjects with in-coordination. Materials and Method: The subjects in Krishna University campus were screened and 44 subjects were divided into 2 groups i.e Group A subjects were given Conventional Physiotherapy for coordination training and Group Eye-Hand Coordination Device along with given Conventional Physiotherapy for coordination training. The interpretation of the study was done on the basis of comparing pre-test and post-test assessment of NCT grading and FMA-UE.

Result: Intra group comparison results showed that NCT grading and FMA-UE scale were statistically significant in both the groups ($p<0.0001$). Whereas the intergroup comparison results showed that Eye-Hand Coordination The device along with Conventional physiotherapy was statistically significant in improving NCT score ($p=0.0021$) and FMA-UE score ($p=0.0001$) than only Conventional Physiotherapy alone for Eye-hand In-coordination.

Conclusion: The Eye-Hand Coordination Device was Significantly effective when Given With Conventional Physiotherapy For treating In-coordination and improvement in coordination. Conventional Physiotherapy is also effective in treating in-coordination, but after certain duration of treatment, the patient starts getting adapted and chances of achieving the plateau phase

Keywords: *Eye-Hand Coordination, coordination device, In-coordination, NCT Grading, FMA-UE.*

Introduction

Coordination or coordinated movement is the ability to execute accurate, smooth and controlled motor responses. It is a complex process dependent on a fully intact neuromuscular system. Coordinated movements are characterized by speed, distance, direction, timing, and muscular tension. Coordination assessments provide physical therapists with information related to motor performance. They help in identifying the source of motor deficits. A variety of observational coordination tests have been presented and researched about the same[1,2].

Eye-hand coordination has been studied as different as the movement of solid objects such as archery, sporting performance, blocks, computer gaming, copy-typing, and even tea-making. It is part of the mechanisms of performing daily tasks; in its absence, most people would not be able to carry out even the simplest of actions such as picking up a book from a table and playing a video game. While it is recognized by the term hand-eye coordination, without exception medical

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sources, and most psychological sources refer to the eye-hand coordination etc[3] We use hand-eye coordination whenever we write. As you start making lines, our eyes send information to the brain to tell it where the hand is placed and if your handwriting is legible With this information, the brain form instructions for how the hand has to move in order to create appropriate shapes and lines, resulting in alphabets. Visual feedback also helps correct letters generated by the previous motor instructions. It is a sequence of precise motor actions that require a certain amount of skill and training.[4]

- A similar sequence takes place when we type on a keyboard. The type of movements are different, but we still use visual information to tell the brain how to guide the hand or if a mistake needs to be corrected.
- When you drive, you are constantly using hand-eye coordination because you have to use the visual information to move your hands on the wheel, keeping the car in the middle of the lane and avoiding accidents.
- Almost every sport requires the use of hand-eye coordination to coordinate what you see with your eyes with the movement if your body. Depending on the sport, the hand-eye coordination (tennis, basketball, baseball, etc.) Or foot-eye coordination (soccer, track, etc.) Will be more used. In any the sport, you can count on the fact that the eyes will be coordinating with some part of the body, so a more appropriate term for this type of coordination may simply be called motor coordination.
- Putting a key in a lock also uses hand-eye coordination. Similar examples would be when you insert a debit card in a chip reader, or when a child plays with toys with various shapes that they have to fit into a certain hole.[4]

Conventionally coordination training is mainly object based i.e training is given with the help of Balls of various sizes, various drills, and agility training.

Various types of exercises like:

- Frenkels Exercises
- Ballon tossing
- Juggling
- Small ball tosing
- Target practice
- Dribbling
- Wall ball bounce
- Target practice [5]

Eye-hand coordination device is a device which can be used to increase in patients eye-hand coordination by asking the patients to perform certain activity a number of times which creates a better performance in eye-hand coordination. The device can be used for many other purposes as a diagnosing tool as well as for treatment. Nowadays there is a paucity of instruments or devices to improve eye-hand coordination. Furthermore, the patient is not able to receive biofeedback much in the other treatment so we can motivate him further by using this handheld instrument as we can make new levels in the instrument. Further, this is a new innovative technique which we can add up in our treatment protocol.

Material and Method

Approval for the study was obtained from the Protocol committee and institutional Ethical Committee of Krishna Institute of Medical Sciences Deemed To be University. The subjects in Krishna Institute of Medical Sciences Deemed To be University campus were screened and those fulfilling the inclusion and exclusion criteria were involved. Participants were informed about the study and consent was taken. Pre-test assessment was taken by using Non-Equilibrium Coordination Test, Non-Equilibrium Coordination Test Grading and FMA-UE to assess the patient. 44 subjects were divided into 2 groups, Group A and Group B based on the inclusion and exclusion criteria. The treatment was started the first day when the subject came for consultation. Group A subjects were given Conventional Physiotherapy and Group B subjects were given Eye-Hand Coordination Device Along with conventional Physiotherapy. The post-test assessment was taken by using NCT Grading and FMA-UE to assess the patient. The interpretation of the study was done on the basis of comparing pre-test and post-test assessment of Non-Equilibrium Coordination Test Grading and FMA-UE.

Group A: Conventional Physiotherapy For improving Coordination:

- Frenkels Exercises
- Ballon tossing
- Juggling
- Small ball tosing

- Target practise
- Dribbling
- Wall ball bounce
- Target practise

Group B: Eye-Hand Coordination Device -Patient should be in sitting position, patient will be asked to hold the hand piece which is of diameter 5cm, 4cm, 3cm, 2cm and 1cm accordingly.

- First the therapist will demonstrate the activity.
- The patient will be handed the hand piece and ask to move the hand piece from starting position to ending position and then again reach the starting point without much shaking of hand piece and with steadiness
- If the patient touches the wire then a buzzer will be on and light will blow and that will a biofeedback that means that the patient has to go to the starting point again for
- For starting we have asked the patient to perform the procedure on a wire which will be a straight line which is the basic level.
- The levels will be made difficult by making the wire into many different shapes.
- Once the patient gains confidence that he can perform the procedure easily he can go to the next level.

Findings: Statistical analysis was done manually and by using the statistics software's INSTAT so as to verify the results derived. The statistical analysis of non-parametric data was done by Wilcoxon matched pairs test and Man-Whitney test. Wilcoxon matched pairs test was used for statistical analysis of pre and post intervention within the group. Man-Whitney test will be used for between groups statistical analysis of Group A and Group B (pre-pre and post-post intervention).

Table 1: Data of NCT

	Non-Equilibrium Coordination Test Grading				p valve (Pre-Post)	Inference
	Pre-test		Post-test			
	Mean	SD	Mean	SD		
Group A	1.545	0.8579	2.636	0.7267	<0.0001	Extremely significant
Group B	1.545	0.5096	3.227	0.4289	<0.0001	Extremely significant
p value (Pre-Pre) and (Post-Post)	>0.9999		0.0021			
Inference	Not Significant		Extremely Significant			

Table 2: Data of FMA-UE

	FMA-UE				p value (Pre-Post)	Inference
	Pre-test		Post-test			
	Mean	SD	Mean	SD		
Group A	33.591	5.413	43.455	5.878	<0.0001	Extremely significant
Group B	34.682	6.105	50.727	5.496	<0.0001	Extremely significant
p value (Pre-Pre) and (Post-Post)	0.5340		0.0001			
Inference	Not Significant		Extremely Significant			

Discussion

Eye-hand coordination is central to so many human activities –the tool used eating, sports and work, to name few as to be defining characteristics of typical human life, conversely, its disruption following the stroke, disease, injury, and developmental disorder leads to considerable degeneration in productivity and quality of life. Normal eye-hand coordination involves the synergistic function of several sensory-motor systems including visual, vestibular system proprioception and the eye heads and arm control systems, plus aspects of cognition-

like attention and, memory[6]. Eye-Hand Coordination Plays an important role in daily activities of living Eg-Eating Food, Drinking Water, Writing Activities, Turning a page etc. In Neurological impaired subjects during Rehabilitation usually, eye-hand coordination mostly gets un-noticed. The objectives of this study were to find the effect of eye-hand coordination device on coordination in subjects with in-coordination. To find the effect of eye hand coordination device along with conventional physiotherapy in improving eye-hand coordination. To compare the effect of Eye-hand coordination device and conventional physiotherapy in improving eye-hand coordination.The study was conducted with 44 subjects. Subjects were divided into two groups. Eye-Hand Coordination device along with Conventional physiotherapy (Group A) and Conventional Physiotherapy (Group B). Prior consent was taken. The treatment protocol was carried out for 6 days per week for 5 weeks. The outcome measures for this study were Non-equilibrium coordination test grading and Fugl-Meyer Assessment-Upper Extremity scoring system. The results of this study showed that there was a significant improvement in Coordination, improving quality of life and reducing rehabilitation time after 5 weeks of intervention in both the group A and group B in Subjects with incoordination. Wilcoxon matched pairs test was used to analyze the effect eye-hand coordination device and showed that there was extremely significant improving coordination in NCT Grading score (p=0.0021) and FMT-UE (p=0.0001).

Researches have proved that there is improvement hand pointing accuracy. A Study Done and they showed that the accuracy of pointing motion of the hand, directed at visual acuity 10° to 40° from the centre, was measured in normal subjects. No visual feedback from the moving hand was available to the participants. The head could be either maintained still (head-fixed condition) or free to move (head-free condition) during the pointing movements. It was found that the error in pointing was reduced for all targets in the head-free condition. This reduction was more important for the more eccentric target (40°). Improvement in accuracy was observed without any significant change in either the latency or the duration of eye, head or hand movements[7]. Another Study showed that Examining the Effects of Proprioceptive Training on Coincidence Anticipation Timing, Reaction Time and Hand-Eye Coordination The study stated that the effects of proprioceptive training on coinciding anticipation timing (CAT), reaction time and hand-eye coordination. 42 volunteer students participated in the paper. These students were randomly divided into two groups as control and experimental groups. An exercise program was applied to the experiment and control groups for approximately 3 days in 8 weeks, for about 45 to 60 minutes. Additionally, a 20-minute modified proprioceptive balance program was applied to the experimental group only. Paired sample tests were used. As a result, significant differences were found in the performance, reaction time and hand-eye coordination performances of the experiment group, pretest, and posttest (p<0,05). Significant differences were found in dominant hand visual reaction time and hand-eye coordination performances of the control group, pretest, and posttest (p<0,05). In conclusion, it is seen that proprioceptive training affect CAT performance and reaction time performances in a positive way.[8]

Conclusion

The present study provided evidence to support the use of eye –hand coordination device along with conventional physiotherapy in improving NCT and FMA-UE scores in Subjects with in coordination.

Conflict of Interest: The authors declare that there are no conflicts of interest concerning the content of the present study.

Source of Funding: This study was funded by Krishna institute of medical sciences Deemed to be University.

Ethical Clearance: The study was approved by the Institutional ethics committee of Krishna institute of medical sciences Deemed to be University, Karad.

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Prevalence of Depressive Symptoms among Incognizant Patients Visiting a Hospital

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Abstract

This article depicts about depressive symptoms among patients visiting a hospital. Depression is the most common mental illness among people in many parts of the world. A person who suffers from depression experiences many symptoms which affects their day to day life to study the contributing factors associated with various levels of depression, a survey was conducted among patients visiting a private dental college at Chennai, Tamil Nadu. Convenience sampling technique was used for the survey. The patients were categorised according to their age, gender, education and employment status. Socio-economic status of the family head was also assessed in the survey. Marital status of an individual and any medical problems presented was also interviewed in the questionnaire. A list of PHQ-9 questionnaire was used to assess the associating factors among various level of depression.

Keywords: *Depression, patients, socio-economic status, prevalence, mental health.*

Introduction

World health organization quoted that more than 322 million people are suffering from depression[1]. In India, it has been reported that 57% million people i.e. 18% of global estimate, are affected by depression[1]. Depression is the most common and significant mental health disorder[2].

Depending upon the age and sociocultural system, depression manifests in different ways and varied presentation. Due to this varied presentation of subjects with depression, the recognition of depression by members of the family and well-wishers at an early stage, particularly mild to moderate depression, is often challenging[1]. The person with depression will experience loss of interest, less energy, poor concentration, disturbed sleep and appetite. According to the severity of depression, it is categorized as mild, moderate and severe[3]. Depression leads to increased irritability, less activity,less attentiveness and fewer facial expressions. The most serious effect of depression is a suicide attempt or completion [4]. Depressed patient usually requires 4-9 months of regular psychiatric consultation and antidepressant therapy.

Thus, considerable attention must be raised regarding detection of depression, as this can limit the impact of depression on the population. The assessment of severity of depression is additionally necessary for proper guidance and treatment planning.[6] There are many approaches to detect depression, one of them is using a questionnaire like Generalized Anxiety Disorder 7-item (GAD-7), Patient health questionnaire 2-items (PHQ-2) and Patient health questionnaire 15-items (PHQ-15) [8]. Patients health questionnaire (PHQ 9) depression Screener was derived from the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM IV) [9]. PHQ -9 questionnaires have been widely

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used among various populations e. g. in a study by Zakiya Al-Busaidi et al [9] it's been used by Oman university for Prevalence of Depressive Symptoms among university students,and also by Roger Muñoz-Navarro et al [8], in a Spanish primary care Centre to identify major depressive disorder in adult patients.

Within the above-mentioned background, studies are needed to explore the significance and the associated factors contributing to emotional disorder among the population. The aim of this study was to explore whether depression is endorsed among patients visiting a dental college for dental problems. The study also aimed to explore the association between depression,gender and socioeconomic status.

Materials and Method

A cross sectional study was conducted among patients visiting a private dental college at Chennai, Tamil Nadu for two months; from October to November 2018. The questionnaire asked focused on the attitude and behaviour of the participants towards the activities that they normally performed over the past couple of days. Convenience sampling technique was used and consecutive patients were interviewed. Individuals who refused to participate were excluded. The purpose and need of the study were explained and informed consent was obtained from the participants. A total of 500 individuals were interviewed. The collected data was kept confidential.

Statistical Analysis: The collected data was analyzed using SPSS version 21.0. For comparing percentages of demographic variables, Pearson's Chi square test was used.

Results

A total of 500 patients (226 males and 274 females) participated in the study. The average age of the patients was 34 ± 11 years. Nearly a quarter of the participants were single,147 and the rest,347 were married (Table 1). The prevalence of depression by severity according to demographic characteristics of the participants is given in Table 2. Among the study population, 433 individuals scored <10 and the rest, 67 individuals had a depression score of >11.

Among the genders, 10% of males and 16% of females had various levels of depression and it was statistically insignificant. (p-value =0.079).

There was a relation between the severity of depression and the socioeconomic status. Five of the upper-class participants scored above 11 whereas 1 of them scored above 20. In the upper middle class, 3 scored more than 20. Sixteen of the middle-class participants scored more than 11, but none of them scored more than 20. On the other hand, none of the lower middle class participants scored more than 11. In lower class patients only one of them scored more than 20. The average depression score was found to be 5.7(SD=4.3) and the median score was 5.0. thus, the severity of depression was related to the socioeconomic status of the patient.

Table 1: Characteristics of the Patients

Patient Characteristics		**Percentage%**
Mean Age ± SD		**34 ± 11**
Gender	Male	45%
	Female	55%
Marital Status	Single	29%
	Married	69%
	Divorced	1.2%
Education	Illiterate	7%
	Primary school	9%
	Middle school	10%
	High school	11%
	Higher secondary	12%
	Graduate	47%
	Post graduate	4%
Medical Conditions	No diagnosed medical conditions	90%
	Asthma	0.8%
	Diabetics	2.2%
	Hypertension	6%
	Thyroid	0.8%
	Psoriasis	0.2%
Habits of Smoking	Present	12.4%
	Absent	87.6%
Habits of Alcohol	Present	21%
	Absent	79%
Socioeconomic Status		
Class I		4.4%
Class II		38.4%
Class III		34.2%
Class IV		21.6%
CLASS V		1.4%

The frequency and percentage of patients responding to each question regarding depressive symptoms experienced in the last two weeks were measured using

PHQ-9. Final consideration of depression scored that only 5(1.0%) of the patients had experienced extreme difficulty in getting along with other people and take care of things and 15(3.0%) patients had found it very difficult to taking care of things at home. It was somewhat difficult for 47(9.4%) of patients. Four hundred thirty-three (86.6%) of patients did not experience any difficulties from depression.

Table 2: Prevalence of depression by severity according to demographic characteristics of the patients

Demographics		Severe Depresson (Score ≥20) (%)	Moderate Depression (16-19) (%)	Mild Depression (11-15) (%)	Normal Depression (Score≤10) (%)	Total Frequency	p- Value
Gender	Male	3(1%)	7(3%)	13(6%)	203(89%)	226	0.079
	Female	2(1%)	8(3%)	34(12%)	230(84%)	274	
Socio-Economic Status	Class I	1(5%)	2(9%)	3(14%)	16(73%)	22	0.000
	Class II	3(2%)	7(4%)	15(8%)	167(87%)	192	
	Class III	0(0%)	4(2%)	12(7%)	155(91%)	171	
	Class IV	0(0%)	1(1%)	15(14%)	92(85%)	108	
	Class V	1(14%)	1(14%)	2(29%)	3(43%)	7	
Education	Illiterate	1(3%)	1(3%)	6(18%)	25(76%)	33	0.122
	Primary School	0(0%)	1(2%)	4(9%)	38(88%)	43	
	Middle School	0(0%)	0(0%)	2(4%)	49(96%)	51	
	High School	0(0%)	0(0%)	5(9%)	48(91%)	53	
	Higher Secondary School	0(0%)	3(5%)	11(18%)	47(77%)	61	
	Graduate	3(1%)	8(3%)	18(8%)	207(88%)	236	
	Post Graduate	1(4%)	2(9%)	1(4%)	19(82%)	23	
Marital Status	Single	2(1%)	7(5%)	16(1%)	122(83%)	147	0.001
	Married	2(1%)	7(2%)	31(9%)	307(88%)	347	
	Divorced	1(17%)	1(17%)	0(0%)	4(66%)	6	
Total		**5**	**15**	**47**	**433**	**500**	

It was seen that, socio-economic status had statistically significant association with depression as in class V.57% had various levels of depression. The level of education did not have any significant association with levels of depression. Marital status of population had statistically significant association level of depression with 34% among the divorced being depressed in various levels (Table 2).

The frequency and percentage of patients' response to PHQ-9 and their experience of depressive symptoms in the last two weeks was compared. It was observed that 160(32%) of patient reported the symptoms of little interest in doing things. 262(52.4%) felt down and 203(40.6%) reported trouble falling or staying asleep or sleeping too much several days a week. Feeling bad about failure and letting their family down was the most common symptom reported on nearly daily basis by 19(3. 8%). On nearly daily basis, 12(2.4%) of patients experience trouble concentrating on television and newspaper. Eighty-two (16.2%) of patients reported suicidal thought and 13(2.6%) have experienced it on nearly daily. It was seen that only 31.4% never felt down or depressed or hopeless while at rest 75.8% felt these symptoms at various period of time. Also 63% had troubled sleep patterns and felt tired. And 3.8% of the study population, felt bad about themselves or felt they were a failure and had let their family down. About a quarter 23.8% had suicidal thoughts. When the subjects were asked about the effect of depression on their day to day activity, it was seen that it was somewhat difficult for 45.2%: very difficult for 9.8% and extremely difficult for 3.2% of the study population.

Discussion

Depression is common disorder among all ages, gender and different socioeconomic groups.[1] In India,

the lifetime prevalence of depression among individuals is 5.25%[1] for individuals of and above 18 years. In the present study,for adults, a PHQ-9 score of 10 or higher was used to identify patients with depression [3]. According to Laura et al[5] patients who score more than 11 can be considered to be depressed**.**

Four hundred thirty three individuals scored <10 and were graded as without depression and 67 individuals had a depression score of >11 and were graded as having mild to severe depression. In the present study, 16% of females suffered from depression which is similar to the study done by Giora Kaplan et al (2010).

Fifty seven percent of study population who have Class V Socio-economic status i.e. low socio-economic class had with various levels of depression which is similar to the study by Zimmerman FJ, et al (2005). Low financial support and poor nutrition might have been the origin of depression in those people. About one third 34%, who were divorced suffered from various level of depression which is also reported by Jang SN, et al (2009). Dissolution in the marriage life caused loneliness, betrayal of trust and loss of moral support which resulted in depression in one's life. Also 63% of subjects had troubled sleep patterns was also analysed by Lund HG, et al (2010). People who were over thinking and anxious about day - to - day life experienced trouble in sleeping. This over thinking sometimes leads to nightmares which affected the sleeping pattern. Around 3.8% of study population felt that they were a failure nearly every day which is also discussed by Bennet DS, et al (2005). Insecurities in one's life posed a negative feeling about themselves and made them to think they were a failure almost every day of their life.

Among the study population, 23.8% reported that they have suicidal thoughts which is similar to study done by Hawton K, et al (2012). Loneliness, the pain of existence became unbearable to the people who were in depression. Thus people had a thought of harming themselves.

Among the study population, 63% of people felt tiredness or little energy at various period of time which is discussed by Balsis S, et al (2008). Fatigue can affect people emotionally and physically. Depressed people felt tiredness or less energy because their body is battling against them both physically and psychologically.

Conclusion

This is the first study to assess the PHQ-9 to obtain the optimal cut-off values for screening patients with depression visiting private dental hospital. The findings presented in this study indicate that the PHQ-9 is a valuable tool to help to identify suspected cases of depression among patients. Based on our results, in this population we recommend using a cut-off value of 11 instead of the most common cut-off value of 10. We also found that depression is common in patients visiting dental hospital with preponderance among females.

Ethical Clearance: Not Applicable.

Source of Funding: Self.

Conflict of Interest: Nil.

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Intelligent System for Physically Challenged Person in Virtual Prototype Environment

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Abstract

In this paper, a framework is fabricated to authorize the physically tested individual device for controlling the needed thing like lighting the room, electrical gadgets with small power application used in an indoor environment. The indoor application controls the wheelchair utilizing only a couple of fingers to do the work effectively. The MEMS-based accelerometers sensor is designed without any pressure and makes the device highly favorable to a physically challenged person. The accelerometers are the small gadget equipped for distinguishing the quickening of the article to which they are appended in which the accelerometers are connected to the fingers for a particular application. The individual, to whom the accelerometers are attached, can assign the control gadget using the straight forward development tool of the fingers like tapping them on the surface to do one particular application in indoor environment. So the novel system is designed and implement for physically challenged person to operate both in indoor and outdoor environment.

Keyword: *Wheelchair, Physically handicapped, MEMS, Gesture control.*

Introduction

Haptics is a late improvement to practical situations permitting clients to "touch" and "feel" the reproduced objects with which they communicate. Haptics is the investigation of touch. The word from the Greek word haptikos which signify "having the capacity to come into contact with". The investigation of haptics rose up out of advances in virtual reality. Virtual the truth is a type of human-PC connection (rather than console, mouse, and screen) giving a virtual situation that one can investigate through direct cooperation with our faculties. They can cooperate with a domain, and there must be criticism. For instance, the client ought to have the ability to touch a practical question and feel a reaction from it. This kind of criticism is called haptic input. In human-PC collaboration, haptic criticism implies both material and power feedback [1]. Haptics connects to an extensive variety of gadgets. In compelling the accuracy, surgical test system use haptics to give sensible power which imitates the vibe range of proper therapeutic strategy method. In forcing for the size of the input power, the gamers can counter the authentification. Furthermore, the first demonstration of the telephone is vibrating when a call is important and straightforward type of innovation. The clinical aptitudes of restorative experts depend entirely on the feeling of touch, joined with anatomical and analytic learning [2]. Haptic environment produced perceptional properties and human haptic recognition as a valuable tool to restorative examination. The characterization of haptic data, and how it can see, is essential to understand how medicinal experts accomplish the haptics to empower learning and achieve the abnormal amount of execution of man power. Papers which investigate haptic models of the patient, and additionally perceptual or behavioral parts of the haptic methodology are pertinent to therapeutic examinations and strategies, are requested. Haptic frameworks and the role of haptics in preparing and assessing clinical abilities: Haptic test systems address a developing requirement for successfully developing and assessment of clinical attitudes [3]. Such test systems can connect a wide range assortment of restorative callings and ordering the identity, including the surgery part, interventional radiology for monitoring, are the new abilities. Papers that location test system advancement and assessment from these points of view are requested[4].

Background Work: MEMS are comprised of segments between 1 to 100 micrometers in size (i.e.

0.001 to 0.1 mm), and MEMS gadgets covers a broad range in size from 20 micrometers (20 millionths of a meter) to a millimeter (i.e. 0.02 to 1.0 mm). This is often to comprise a focal unit which procedures the information on microchip and a few segments that associate with all surroundings, for example, small-scale sensors. At these size scales, the standard develops of established material science are not generally helpful[5]. Index finger course based robot is a machine that is controlled by a MEMS sensor through Radio recurrence innovation. The sensor which put on our index finger works when the heading of the finger changes. Limited component investigations utilizing human finger model amid element touch demonstrated that spatial data of the textured surface identified the transient recurrence changes at the position of material receptors in the finger print interface [6]. In touch sensor exercises, the people can evaluate one by one by means of relative hand speed between the surface texture and in the investigating finger, of spatial period of the surface can be seen by integrating the transient recurrence of the vibration in sensor mode [7]. So that f=v/p printed on the sensor mode .In counterfeit touch it propagate the signal, while considering innovative methodologies in which mechanical detecting components inserted on skin-like structure elastomeric grid on the surface that copy human skin penetration, such as vibrations analysis sought to be evoked by boost skin interface which releases the effect, by this movement elements are controlled, and by contact mechanics the effect is evoked, and afterwards assembling and detecting the units are situated under the protecting material [8]. Stimuli are the responses, when connected in mean level heads against the surface of the skin tissue -like material of the clusters cells, which may brought about a huge compelling noise of the sensor node component with a unique mark sort surface than that with a smooth surface [9]. A. MEMS Sensor Micro electro mechanical frameworks (MEMS) (additionally composed as miniaturized scale electro-mechanical, Micro Electro Mechanical or microelectronic and smaller scale electromechanical frameworks) is the innovation of little gadgets; it converges at the Nano-scale into Nano electromechanical structures (NEMS) and nanotechnology. MEMS likewise alluded to as micro machines (in Japan), or Microsystems innovation–MST (in Europe) [10].

Material and Method

The figure 1 shows the proposed block diagram for a physically challenged person both indoor and outdoor environment. The proposed block diagram consists of two parts; the first part consists of transmitter section in which the information transmitted through a particular distance with MEMS sensor (micro electronics mechanical system). The mem sensor is controlled by microcontroller through various action of disabled person the output section is controlled. The information is transmitted with antenna through only a small distance the position of antenna alignment is controlled with a particular frequency. The same frequency is controlled by receiver and demodulates the signal according to the input through which it takes the time delay and propagates in the receiving end through which led buzzer and led maintained. The relay is maintained o make the signal low enough and characteristics signal is maintained according to the input. So the wheel chair car controlled in the receiving end also. The proposed block diagram explains about the interferences which is mem sensor both in the transmitting end and receiving end. Further mode the device is completely implement with low cost dynamic system and it takes advantages of reducing the entire size of the hardware with low power dissipation factor. This system can be easy to carry anywhere both indoor and outdoor environment to do particular work and implement in any part of the world for physically handicapped person. The above-shown data are the block diagram implemented in this paper. The entire system divided into two modules; they are the human interface module and the robot interface module. Each one of this module s described below. The MEMS connected to the microcontroller unit which given as a PDA to the physically challenged person. The MEMS placed on the person for the gesture movements which converts the signal level with respect to mean value. Each position of the person holds the MEMS sensor for individual gesture analysis specified. When the person specifies his hand forward or backward or in any direction, that signal received by the microcontroller and sent to the antenna. The robot unit receives the signal obtained from the antenna. This robot unit is nothing but a wheelchair unit. Two relays placed on two wheels which receive the input from the microcontroller. The microcontroller will give the direction to control the motors to move. This direction purely based on the muscle movement of the person which is indeed received by the MEMS placed in them. At the point when the digit on the surface, the movement of the finger identifies the accurate analysis and the same is utilized as a trigger sign to turn an electrical gadget on or off.

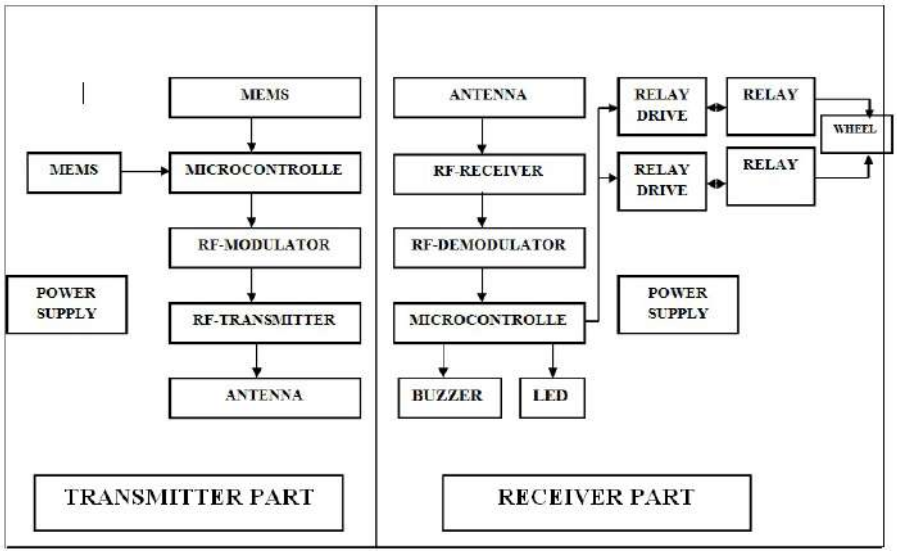

Figure 1 Block Diagram of the Interface Controller for human system

The human machine interface provides a highly visual device with low cost, comprehensive and intuitive design with low power and allow the system to operate efficiently has designed by the designer. For outdoor environment that are very expensive and difficult to observe all the parameters visually. So the proposed system is designed with low cost and low power system device.

Result and Discussions

The figure 2 and figure 3 is implemented with mem based accelerometer is proposed both in the transmitter and receiver end and circuit diagram is also proposed. The hardware device consists of power supply block, microcontroller block, mems sensor and a camera to visualize the entire object both in indoor and outdoor environment. The power supply gives moderate 12.5v to microcontroller mem sensor and camera. The microcontroller revises the voltage and controls the mem sensor and camera to operate the wheel chair car for a physically handicap person. The device can be applicable and implemented all types of physically challenged person

The same trigger sign can use for controlling a wheel seat's development: a microcontroller unit and a drive circuit used for controlling the gadgets. Numerous fingers can use for some such particular reactions from which various devices can control the internal environment. Further, if the individual can control the power of tapping the distinctive intensities of tapping can be utilized to control besides gadgets. Subsequently, the accelerometers are appended to the fingers of a man which can use as a virtual keypad to control any device in indoor environment. Furthermore, the entire framework can be made smaller which gave to remote control gadgets for assembling on a separate sheet. However, this framework can go about as a straightforward and hazel free guide for the physically debilitated.

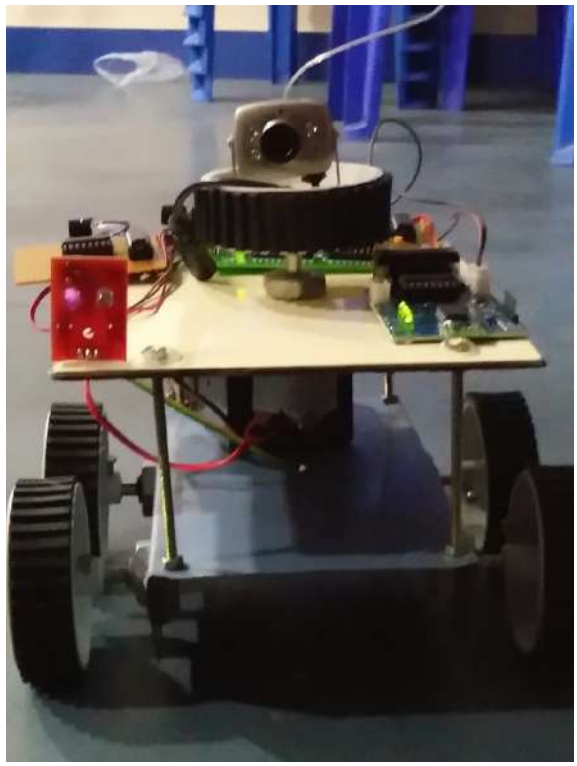

Figure 2. Hardware for Proposed Circuit

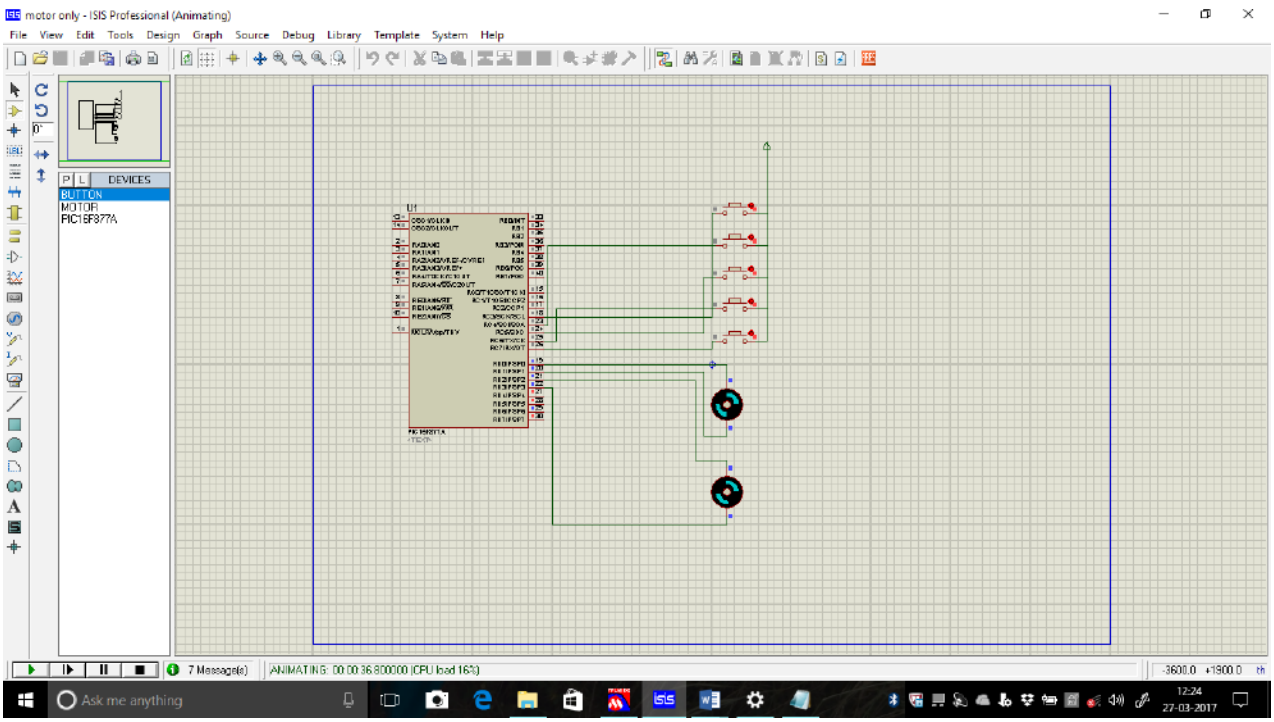

Figure 3: Circuit diagram for the proposed system

Conclusion

The intelligent assisting device designed and implemented to assist the physically challenged people in satisfying their basic needs using MEMS accelerometer sensor. This is accomplished using the physically challenged people who do not depend on others and they are trained by themselves and 60% of their work aligned or motivated using self performance. In future, the same system can e developed in such a way that the height movements of the wheelchair can be adjusted.

Conflict of Interest: There is no conflict of interest assigned in this research paper

Source of Funding: Self

Ethical Clearance: The research work proves in the novelty of the proposed action.

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Health Insurance Utilisation Pattern in Two Districts of Karnataka

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Abstract

Introduction: Health insurance is a widely recognized and preferable mechanism to finance the health care expenditure of the individuals. It is an important mechanism in the modern world to save the individuals from the huge health shock but only a small percentage of people even from educated higher income groups are covered under any health insurance policy. This study was undertaken to know the pattern of health insurance utilization in Uttar Kannada and Udupi districts of Karnataka.

Material and Methodology: A descriptive study was conducted among 550 household of Uttar Kannada and Udupi districts. Household were selected using multistage sampling technique.

Results: Of the 550 study participants, 348 (63.27%) were aware and also subscribed for any type of the health insurance and of these only 89 (25.57%) utilized them. 190 (34.55%) had availed Rashtriya Swasthya Bima Yojana, 42 (7.64%) for Yashasvini, 6 (1.09%) for ESI, 12 (2.18%) for Sampoorna Suraksha and 15 (27.27%) had private insurances. Reasons for not availing health insurances other than being unaware were complicated process 85 (42.08%) and provides only partial coverage 49 (24.26%). The main reasons for not using the health insurance were non availability of empanelled hospital 84 (74.34%), disease not being under the scope of scheme 60(23.17%) and 32 (12.36%) were unaware about the process of availing.

Conclusion: Health insurances being are the best way to help people reduce their financial burden has to be made aware and the drawbacks have to be addressed.

Keywords: *Health insurance, utilization, Udupi, Uttar Kannada.*

Introduction

Health is multi-dimensional and is 'a state of complete physical mental and social wellbeing and not merely an absence of disease or infirmity and the ability to lead a socially and economically productive life' as defined by World Health Organisation (WHO). An understanding of health is the basis of all health care.[1] In many countries health is a fundamental human right.[2] The glaring contrast in the state of health between the developed and developing countries, between rural and urban areas and between the rich and poor have attracted worldwide criticism as 'social injustice'. The commitment of all countries, under the banner of WHO, is to wipe out the inequalities in distribution of health resources and services, and attain Sustainable Development Goals.[1]

Socio-Economic development and health of community cannot be achieved in isolation as they are

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related with each other.[3] Despite large improvements in recent years, life expectancy in India still remains below than other countries following a similar pattern of development.[2]

Health outcomes and service provision vary significantly across different states, with only a few providing access to comprehensive basic healthcare services to all.[2] Various studies reveal that in India more than 80 percent of health care financing is mainly in the form of out-of-pocket (OOP)[3] often posing an enormous burden on underprivileged households. The costs are frequently high enough that households are unable to recuperate them from existing resources.[4]

Human life is unpredictable and in case of emergency health situations, health insurance can make it safe and secure from bearing huge financial loss and decreasing economic burden on the family members.[5] Health insurance is a widely recognized and preferable mechanism to finance the health care expenditure of the individuals.[3]

The International Labour Organization defines health insurance as "the reduction or elimination of the uncertain risk of loss for the individual or household by combining a larger number of similarly exposed individuals or households who are included in a common fund that makes good the loss caused to any one member".[5] Health insurance policy is a contract between an insurance company and an individual and comes in handy in case of severe emergencies.[(6)] These insurance system works on the basic principle of 'pooling of risks of unexpected costs of persons falling ill and needing hospitalization by charging premium from a wider population base of the same community'.[7]

This study was undertaken to know the pattern of health insurance utilization in Uttar Kannada and Udupi districts of Karnataka.

Materials and Methodology

A community based descriptive study was conducted from June 2016 to August 2018 among 310 study participants from Uttar Kannada and 240 study participants from Udupi, a total of 550 households. Households were selected randomly and those houses which were locked at the time of visit and those who did not give consent to participate in the study were excluded Multistage sampling technique used to collect the sample for the study.

The pre-designed and pre-tested proforma was used to collect information on socio-demographic profile and health insurance utilization of the study participants. Data collected were entered in Microsoft Excel and analysis was carried out with the help of Statistical Package for Social Sciences–20.0.1 (SPSS Statistics–20.0.1). Data was presented using proportions and percentages.

Results

The study was conducted in few selected villages in Uttar Kannada and Udupi districts. Of the 550 study participants, 310 were from Uttar Kannada and 240 were from Udupi.

Health insurance (HI) was availed by 185 (59.68%) in Uttar Kannada and by 163 (67.92%) in Udupi. Table II and III shows the district wise distribution of study participants those who subscribed for health insurance and those who used the health insurance respectively.

Table I: Distribution of study participants based on their awareness regarding health insurance.

Awareness		Uttar Kannada, n (%)	Udupi, n (%)	Total, N (%)
Yes and subscribed for HI, 348 (63.27%)	Utilized	42 (2.90)	47 (18.33)	89 (25.57)
	Not utilised	143 (17.42)	116 (13.75)	259 (74.43)
Yes and not subscribed		71 (2.90)	44 (18.33)	115 (20.91)
No		54 (17.42)	33 (13.75)	87 (15.82)
Total		310	240	550

Table II: District wise distribution of study participants based on health insurance subscribed.

Health Insurances Availed	Uttar Kannada, n (%)	Udupi, n (%)	Total, N (%)
RSBY	107 (57.84)	83 (50.92)	190 (54.59)
Yashasvini	23 (12.43)	19 (11.66)	42 (12.07)
ESI	2 (1.08)	4 (2.45)	6 (1.72)
Sampoornasuraksha	7 (3.78)	5 (3.07)	12 (3.45)
RSBY, Yashaswini	22 (11.89)	17 (10.43)	39 (11.21)
RSBY, ESI	1 (0.54)	6 (3.68)	7 (2.01)
Yashaswini, ESI	5 (2.7)	3 (1.84)	8 (2.3)
RSBY, Yashaswini, Sampoornasuraksha	6 (3.24)	4 (2.45)	10 (2.87)
Yashaswini, Sampoornasuraksha	1 (0.54)	2 (1.23)	3 (0.86)
RSBY, Sampoornasuraksha	1 (0.54)	12 (7.36)	13 (3.74)
Private insurances	7 (3.78)	8 (4.91)	15 (4.31)
Yashaswini, Private insurances	3 (1.62)	0	3 (0.86)
Total	185	163	348

Of the 185 study participants from Uttar Kannada who availed health insurance, 162 (87.57%) paid a premium of less than Rs 500, 13 (7.03%) paid Rs 500-1000 and 10 (5.40%) of them paid more than Rs 2000. In Udupi 142 (87.11%) paid <Rs 500, 13 (7.98%) paid Rs 500-1000 and 8 (4.91%) paid > Rs 2000. Frequency of premium payment in all the card holders was annually. Whole family was covered in all those who had health insurance. A coverage of Rs 25001-50000 was provided to 119 (64.32%) from Uttar Kannada and 104 (63.8%) from Udupi and 66 (35.68%) from Uttar Kannada and 59 (36.2%) from Udupi were covered for more than 1 lakh.

Table III: Distribution of study participants based on the health insurance utilized.

Health insurance utilised	Uttar Kannada, n (%)	Udupi, n (%)	Total, N (%)
RSBY	10 (23.81)	8 (17.02)	18 (20.22)
Yashasvini	15 (35.71)	9 (19.15)	24 (26.97)
ESI	5 (11.90)	6 (12.77)	11 (12.36)
Sampoornasuraksha	3 (7.14)	9 (19.15)	12 (13.48)
RSBY, Yashaswini	1 (2.38)	2 (4.26)	3 (3.37)
RSBY, ESI	-	-	-
Yashaswini, ESI	2 (4.76)	2 (4.26)	4 (4.49)
RSBY, Yashaswini, Sampoornasuraksha	-	-	-
Yashaswini, Sampoornasuraksha	1 (2.38)	1 (2.13)	2 (2.25)
RSBY, Sampoornasuraksha	-	4 (8.51)	4 (4.49)
Private insurances	3 (7.14)	6 (12.77)	9 (10.11)
Yashaswini, Private insurances	2 (4.76)	-	2 (2.25)
Total	**42**	**47**	**89**

Table IV: Reasons for not subscribing for HI and not utilizing the HI they availed.

Reasons for not availing (n=202)*	Uttar Kannada, (n=125) (%)	Udupi, (n=77) (%)	Total, (N=202) (%)
Not aware	54 (43.2)	33 (42.86)	87 (43.07)
Process is complicated	51 (40.8)	25 (32.47)	85 (42.08)
Not interested as I can afford The cost of treatment	17 (5.6)	13 (16.88)	30 (14.85)
Most of the Health Insurance provides partial coverage	30 (24)	19 (24.67)	49 (24.26)
It is not cashless	36 (28.8)	15 (19.48)	51 (25.24)

Reasons for not using HI*	Uttar Kannada, (n=143) (%)	Udupi, (n=116) (%)	Total, (N=257) (%)
Unaware about the process of availing	12 (8.39)	20 (17.24)	32 (12.45)
Lack of required documents	6 (4.19)	0	6 (2.33)
Maintained good health	5 (3.49)	32 (27.58)	37 (14.39)
Non availability of empanelled hospital	43 (30.07)	41 (35.34)	84 (32.68)
Health assurance scheme covered the expenses	13 (9.09)	12 (10.34)	25 (9.73)
Disease was not under the scope of scheme	29 (20.28)	31 (26.72)	60 (23.35)
Financial coverage limit of card was drained	0	2 (1.72)	2 (0.780)

*Multiple answers were given.

Two (1.23%) of them who had subscribed for health insurance did not renew even after its validity was expired and the reason was high premium in both the cases. Facilities provided by the health insurance is described in table V. Most 252 (72.41%) of the health insurances provided inpatient services and travel allowance. Only few 21 (6.03%) provided outpatient and emergency services. Among the inpatient services most 190 (54.6%) of the health insurance covered only medical treatment and 114 (32.76%) of them covered both medical and surgical treatment. Only 13 (3.74%) were free to choose the health care institution of their choice.

Table V: Distribution of study participants based on the facilities provided by the health insurance.

Facilities	Uttar Kannada, n=185 (%)	Udupi, n= 163 (%)	Total, N= 348 (%)
In Patient Services	37 (20)	38 (23.31)	75 (21.55)
In Patient Services and travel allowance	140 (75.68)	112 (68.71)	252 (72.41)
Emergency Service, In Patient Services, Travel allowance and daily allowance	8 (4.32)	13 (7.978)	21 (6.03)
IP Facilities			
Medical Treatment	107 (57.84)	83 (50.92)	190 (54.6)
Medical Treatment, Surgery, Implants, Preventive Measures, Ambulance service, Maternity/Delivery services	56 (30.27)	58 (35.58)	114 (32.76)
Surgery, Implants, Preventive Measures, Ambulance service, Maternity/Delivery services	22 (11.89)	22 (13.5)	44 (12.64)
Freedom to select health care institution			
Yes	5 (2.70)	8 (4.91)	13 (3.74)
No	180 (97.3)	155 (95.09)	335 (96.26)

Most 34 (38.2%) them who had utilized health insurance utilized it only once. Five (11.91%) of them from Uttar Kannada and 2 (4.26%) from Udupi utilized it 5 times. Six of them who utilized never had cashless benefit. It was either partial coverage or reimbursement. It can be seen that the health insurance which provided cashless benefits were utilized more.

Table VI: Distribution of study participants based on health insurance utilization and cash benefit.

Number of times heath insurance utilized	Uttar Kannada, n=42 (%)	Udupi, n=47 (%)	Total, N=89(%)
1	17 (40.48)	17 (236.17)	34 (38.20)
2	15 (35.71)	14 (29.78)	29 (32.58)
3	4 (9.52)	12 (25.53)	16 (17.98)
4	1 (2.38)	2 (4.26)	3 (3.37)
5	5 (11.91)	2 (4.26)	7 (7.86)

Number of times cashless method was provided			
0	3 (7.14)	3 (6.38)	6 (6.74)
1	19 (42.24)	18 (38.30)	37 (41.57)
2	10 (23.81)	10 (21.28)	20 (22.47)
3	4 (9.52)	12 (25.53)	16 (17.98)
4	1 (2.38)	2 (4.26)	3 (3.37)
5	5 (11.91)	2 (4.26)	7 (7.87)
Number of times reimbursed			
0	38(90.48)	45(95.74)	83 (93.26)
1	2 (4.76)	0	2 (2.25)
2	2 (4.76)	2 (4.26)	4 (4.94)

Discussion

This cross sectional study was conducted among 550 households in Uttar Kannada and Udupi districts to know their health insurance utilization pattern. This study showed that 20.91% of them did not avail for any health insurance even if they were aware of it and also only 25.57% of them who had health insurance utilized it. This shows the deficiencies in the health insurances available.

In the present study health insurance was availed by 59.68% in Uttar Kannada and by 67.92% in Udupi. In another similar study done in rural areas of Bangalore in 2015 among 399 study participants, 66.9% had health insurance coverage.[8] A study done in St.John's Medical College, Bangalore in 2007 among 200 households to study the awareness, prevalence and utilization of Health Insurance services it was seen that 47.5% of the individuals were aware of health insurance, 42.5% had availed for health insurance, of them 32.9% had utilized health insurance.[9]

In the present study, 34.55% had availed Rashtriya Swasthya Bima Yojana, 7.64% for Yashasvini, 1.09% for ESI, 2.18% for Sampoorna Suraksha and 27.27% had private insurances. In a study in rural Bangalore 92.6% of the study participants were covered by Government health insurance schemes and 7.4% had private health insurance schemes.2 In a another study conducted by Public Health Foundation of India, it was reported that coverage of health insurance by Vajpayee Arogya Shree scheme was 0.95 million families in Karnataka, Rashtriya Swasthya Bhima Yojana covered 22.7 million families across India, 55 million individuals were covered by Yeshaswini scheme in Karnataka and 14.3 million families were covered by ESI scheme.[10]

Conclusion

Even though more than half the study participants subscribed for health insurance, only quarter of those who subscribed utilized it. Major reason for this was not being aware about health insurances or the process for utilization. This shows the gap in communication between the health personals and the general population. There are few more who even if they were aware did not avail for any health insurance. The reasons being non availability of empanelled hospital, limit of financial coverage, the disease not covered and high premium. These drawbacks in the health insurances that are available should be addressed as health insurances are the best way to help people reduce their financial burden.

Hence it is very important to educate the community regarding the best health insurance available so that they can take the maximum benefits from it.

Declaration:

Conflict of Interest: No

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Study of Knowledge, Attitude and Practise (KAP) Regarding Swachh Bharat Mission Among High School Students in Field Practise Area of Medical College in Dakshina Kannada, Karnataka

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Abstract

Background: India generates about 60 million tonnes of garbage every day, of this around 45 to 50 million tonnes is left untreated. Wastes are thrown on the streets. Open defecation is still a problem in rural India. All these actions cause health hazards among population.

Objective: To assess the knowledge, attitude and practices regarding Swachh Bharat among 8th to 10th standard students.

Methodology: This cross-sectional study was carried out in seven government high schools in the field practice area of a medical college in Mangalore. A total of 441 government high school students from 8th to 10th standard were included in the study. Collection of data was done by interview method using pretested semi structured questionnaire.

Results: Total of 441 students were included in the study. 55.32% were boys and 44.68% were girls. According to scoring done for students, 84.35% had good knowledge, 95.23% had good attitude but only 50.34% had good practice about environmental cleanliness and personal hygiene.

Conclusion: To improve the good practice various health educations and practical demonstrations about the cleanliness and benefits of practicing them can be conducted as school-based initiatives to create awareness among students.

Keywords: *Knowledge, School students, Environment, Sanitation, Awareness, India.*

Introduction

India generates about 60 million tonnes of garbage every day, of this around 45 to 50 million tonnes is left untreated. In 2040, Urban India alone would generate 10 million tonnes waste daily. India's sewage system is among the poorest in the world. Wastes are thrown on the streets. Open defecation is still a problem in rural India. All these actions cause illness, makes the country sicker [1].

Government of India initiated the Central Rural Sanitation Programme (CRSP) in 1986 primarily with the objective of improving the quality of life of the rural people and also to provide privacy and dignity to women. From 1999, a "demand driven" approach under the "Total Sanitation Campaign" (TSC) emphasized more on Information, Education and Communication (IEC), Human Resource Development (HRD), Capacity

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Development activities to increase awareness among the rural masses and generation of demand for sanitary facilities. Later "Nirmal Bharat Abhiyan" (NBA) was launched on 1.4.2012 to accelerate the sanitation coverage in the rural areas. Under NBA, the incentives for IHHLs were increased and further focused support was obtained from MNREGA. However, there were implementation difficulties in convergence of NBA with MNREGA as funding from different sources created delays at the implementation mechanism. To accelerate the efforts to achieve universal sanitation coverage and to put focus on sanitation, the Prime Minister of India Shri Narendra Modi launched the Swachh Bharat Mission on 2nd October, 2014. The Mission shall remove the difficulties that were hindering the progress, including partial funding for Individual Household Latrines from MNREGS, and focusing on critical issues affecting outcomes. [2]

Shri Narendra Modi urged people to denote 100 hours every year towards cleanliness. Union Ministry of Rural Development and Drinking Water and Sanitation announced 20 lakhs to be given to every village per year to achieve the goal of Swachh Bharat. [3]

School provides an excellent opportunity for children to learn about healthy hygienic practices and also identified as powerful channel of communicating sanitation messages to homes and communities. Through our study we aim to assess the knowledge, attitude and practices of students about Swachh Bharat and educate them in this regard.

METHODOLOGY: - This cross-sectional study was carried out in seven government high schools in the field practice area of a medical college, in Dakshina Kannada district, Karnataka. The study subjects were selected by Cluster sampling method. A total of 441 government high school students from 8th to 10th standard were included in the study. The purpose of the study and procedure were explained to the students in the local language and oral informed consent was obtained from them. Collection of data was done by interview method using pretested semi structured questionnaire which had questions to assess the Knowledge, attitude and practice amongst the students on Swachh Bharath Mission.

Statistical analysis was done using SPSS software. Data was expressed in tables and graphs. Knowledge was scored, +1 was given for the correct answer and 0 for the incorrect answer. Scoring was done. Score 0-2 was considered as poor knowledge, 2-5 considered as average knowledge and >5 as good knowledge. Attitude was also scored, +1 was awarded for positive attitude and 0 was awarded for negative attitude. Score less than 0-2 was termed as poor attitude, 2-5 as average and more than 5 was taken as good attitude. Practice was also scored the similar way. Inclusion criteria: All the students between 8th to 10th standard who were willing to participate in the study were included. Exclusion criteria: Students who were absent during the time of study, were excluded from the study

Results

Table 1: Socio-demographic distribution of the study subjects (N=441)

Age	No. of Students	Percentage
13	133	30.3%
14	137	31.2%
15	171	38.5%
Place of School		
Sashitulu	48	10.8%
Faringepete	48	10.8%
Hejmady	29	6.5%
Subramanya	65	14.7%
Nitte	121	27.4%
Bailur	100	22.6%
Natekal	30	6.8%
Standard		
8th	128	29.04%
9th	115	26.07%
10th	198	44.89%
Sex		
Boys	244	55.32%
Girls	197	44.68%

Table 1 shows that majority of students were belongs to age 15. Boys (55.32%) were more than the Girls (44.68%). More students were belonging to Government high school (27.4%) of Nitte village.

Table No.2 Knowledge and Attitude about Swachh Bharat Abhayan among study subjects

	Yes	No
Do we require separate toilet for Boys and Girls in school	100%	0
Solid waste disposal should be taught in school	87.98%	12.02%
Proper waste removal and disposal is important	97.95%	2.05%

Any member of household has heard about Swachh Bharat	90.02%	9.98%
Do you feel street should be clean and free of solid waste	94.78%	5.22%
Does improper waste removal and disposal affect environment	90.02%	9.98%
Is water made available for use in toilets	87.98%	12.02%
Soap is available in school toilets for washing hands	57.59%	42.41%
Does your household have a toilet	97.27	2.73%
Did any member of the household defecate in the open in the last three months or after gaining access to toilet	14.06%	85.94
Is there any garbage or litter piled up or dumped within 10 feet perimeter of the house, outside the premises of the household being canvassed	41.04%	58.96%
Does anyone go out and defecate in open in your village	20.1%	79.9%

In table two 57.59% of students told that soap was present in school toilet for washing hand. 41.04% students told that Garbage disposal near the houses still persist in their village. 20.1% students told open air defection was still present in their village.

Table No. 3 Practice of Swachh Bharat Abhayanamong study subjects

	Yes	**No**	
Washing hands with soap after defecation	80.72%	19.28%	
Use of dustbin at school for dumping waste	89.56%	10.44%	
Use of Toilet in the household	97.27	2.73%	
Availability of the water in/for the toilet	92.06	7.94%	
Do the family members segregation of waste as dry waste and wet waste	53.96%	46.04%	
Place of dumping the food waste at school	**Dustbin**	**Compost**	**Other**
	71.42%	28.11%	0.47%
Site of human waste disposal from the toilet	**Drain pit**	**River**	**Open Drain**
	87.52%	1.2%	11.3%

In table three 80.72% of the subjects use soap for washing hands after defecation and 89.56% of subjects use dustbin to dumping waste in school. 97.27% of subjects use toilet for defection. 53.96% of subjects told that the family segregate the waste into dry and wet separately. 71.42% subjects dump the food waste in dust bin and 28.11% into composting. Human waste disposal from toilet mainly to drain pit (87.52%) followed by open drain (11.3%) and to river (1.2%).

Table No 4 Scoring of the Study Subjects Under Knowledge, Attitude And Practice in Swachh Bharat Abhayan

Knowledge	Poor	Average	Good
	0	69(15.64%)	372(84.35%)
Attitude	Poor	Average	Good
	0	21(4.76%)	420(95.23%)
Practice	Poor	Average	Good
	0	219(49.65%)	222(50.34%)

Table four knowledge score was good in 84.35% and average among 15.64% of study subjects. Attitude was good in 95.23% and average among 4.76% of the study subjects. Practice was good in 50.34% and average among 49.65% of study subjects responding to Swachh Bharath Abhiyan.

Discussion

Total of 441 students were included in the study. In that 55.32% were boys and 44.68% were girls with 30.3%, 31.2% and 38.5% belonging to age group of 13, 14 and 15 years respectively.

97.27% said their household had a toilet but only 87.98% had water available in the toilet due to limited supply of water with majority of them stating that human waste was disposed in drain pits rather than river or open drain indicating unsanitary practices and they were educated regarding proper waste disposal. All of them agreed that the schools had separate toilets for boys and girl which were kept clean.

In the present study 80.72% of the subjects use soap for washing hands after defecation and97.27% of subjects use toilet for defection. Study done by Swain P et al showed that only 54% of the individuals were defecating in the toilets and 8% of the respondents didn't wash their hands after defecation.[4]

Hand washing after defecation with soap was practiced by 80.72% of students which was way higher than a study conducted by Shrestha A et al among primary school going children of urban Karnataka.[5]

20.1% students noticed that residents from their area practiced open defecation and most of them had family member who still continues the same even after gaining access to toilet because of their developed as routine

and unawareness about its effect on their health and environment.

Majority of them thought proper waste disposal is important in the house but only 53.96% practiced segregation of waste as they had lack of knowledge and 87.98% asked for education on the subject in schools. For general waste disposal, 89.56% of them used dustbin in school for dumping and only 28.11% used compost for food waste and we educated them the benefits of compost over dustbins.

Almost all of them (99.3%) have good perception of the cleanliness of their school compound but 41.05% noticed garbage near their houses and opinionated that it should be cleaned as improper waste disposal affects the environment. This shows their knowledge towards Swachh Bharat and their willingness to take initiatives for the same. Study conducted by Tiwari S K showed that all students were aware of the mission Swachh Bharat: Swachh Vidyalaya and the level of awareness of the students from public school and private schools was equally good.[6]

Knowledge about the Swachh Bharat Abhayan in the household of these students was about 90.02% which shows the effectiveness of various means promoting this mission. According to scoring done for students, 84.35% had good knowledge, 95.23% had good attitude but only 50.34% had good practice about environmental cleanliness and personal hygiene which was either due to their acclimatization to existing old habits and mindset.

Conclusion

The study conducted showed that study subjects had good knowledge and good attitude towards Swachh Bharat Abhayan but a lack of practice was seen among them. So, various health educations and practical demonstrations about the cleanliness whether environmental or personal and benefits of practicing them can be conducted as school-based initiatives to create awareness among students.

Conflict of Interest: Nil

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Ethical Clearance: Taken

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Association of Personality Traits, Life Satisfaction, Subjective Happiness and Oral Health Status in School Teachers of Vikarabad

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Abstract

Background: To determine the association between personality traits, life satisfaction, subjective happiness and oral health status in school teachers of Vikarabad.

Material and Method: A cross sectional study was conducted among 400 private and government school teachers of Vikarabad. A validated questionnaire was used (BFI)-10 to measure personality traits, life satisfaction and subjective happiness. Clinical examination was done to measure DMFT and OHI-S. Collected data was subjected to statistical analysis. Spearman's Correlation and multiple regression analysis was done.

Results: Among the teachers 13% were males and 87% were females and their mean age was 30 years. 57% had high and 43% had low levels of extraversion, 55% had high and 45% had low levels of agreeableness in their personality. The mean DMFT score was 1.12 ± 1.41 and mean OHI-S score was 1.71 ± 1.06.

Conclusion: A significant association was observed between personality traits and satisfaction in life of teachers with their oral health. Satisfaction with life will improve the quality of life and wellbeing of individuals.

Keywords: *Personality traits, School teachers, subjective happiness, life satisfaction, dental caries, oral hygiene.*

Introduction

Oral diseases are a significant public health burden in India as well as across the globe. The consequences of widespread poor oral health can be seen at the personal, population, and health systems level.[1] According to previous research,good oral health is independently associated with greater subjective well-being.[2] The term "well-being" is frequently used in literature to mean happiness. However, well being is commonly used in relation to physical factors and happiness used in relation to mental factors.[3] Happiness is a multidimensional construct comprising both emotional and cognitive domains, and has been defined as 'the degree to which an individual judges the overall quality of his or her life favorably as a whole'.Several factors which affect happiness of a person like income, job satisfaction, community values, health, family experience, education, sleep habits, personality based traits and life satisfaction[4]

Life Satisfaction (LS) has been conceptualized as a cognitive constituent of subjective well-being. High satisfaction suggests that the quality of life, in

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the population concerned, is good. Low satisfaction on the other hand marks serious shortcomings of some kind. Research has suggested that stress, depression and ineffective coping may contribute to development of periodontal diseases and dental caries. Dental caries and periodontal diseases are the two major oral diseases, which are universal in distribution and constitute the primary reason for tooth mortality. Particular personality types of people are more prone to ineffective coping with stress, depression and hence may affect their carious experience. Personality Traits (PT) of an individual reflect people's characteristic patterns of thoughts, feelings, and behaviors. People with different PT tend to experience different degrees of subjective well-being.[5,6]

Meshram et al[8] suggest that there exists no co-relation between various personality traits and associated oral health status. Tuchtenhagenet al [4] concluded that oral conditions like dental caries is influenced by happiness of school children. In a study conducted by Dumitrescu et al[10] life satisfaction and subjective happiness indicators seemed to be associated with self-reported oral health status and behavior.

In today's global world, workers like public and private school teachers are put under a lot of stress which influences their psychological well-being. They feel burned-out, unhappy, dull, or unsatisfied because of factors such as high teacher-student ratio, inconvenient or inefficient physical school conditions and low salaries.[11] There exists, no literature about oral health and its association with factors like PT, Subjective Happiness (ST) and LS in this population. Hence, the present study was carried out with an objective to determine the association of the personality traits, life satisfaction and happiness with oral health among school teachers of Vikarabad district.

Methodology

A cross sectional epidemiological study was conducted among school teachers in various government and private schools in Vikarabad District, Telangana. India. A pilot study was carried out to test the feasibility of the study and understanding of the questionnaire. With an estimation of 80% power of study, alpha error of 5%, and assuming the prevalence of dental diseases as 50%, sample size was estimated at 384,which was rounded to 400. Permissionto conduct the study was obtained from DEO of district. School principals who granted permission and teachers willing to participate were included**.** Teachers who have migrated to work place from other population were excluded. Questionnaire recorded socio-demographic factors and questions about sleep quality, smoking status, physical activity and self reporting of their general health status. Standard questionnaires were used for measuring the personality traits (BFI-10)[11], Life Satisfaction Scale (LSS)[12], and Subjective Happiness Scale (SHS)[13]. Both Telugu and English questionnaires were used in the present study. The content validity and the internal consistency was found to be good (Cronbach"s alpha = 0.78).The oral health status of the subjects was recorded using WHO Oral Health Proforma 1997 [14] for recording the dentition status and Oral Hygiene Index Simplified (OHI-S). Collected data was subjected to statistical analysis using SPSS version 20. Outcome variables DMFT and OHI-S were associated with the independent variables like PT, LS and SH. Spearman's correlation and linear regression analysis was done to know the overall association of the outcome variables on all the independent variables.

Results

In this study total male teachers were 13% and females were 87% with a mean age of 35.11±10.21. 48% were government and 52% were private school teachers. 20% of teachers had trouble in night sleeping and 80% of teachers were satisfied with their night sleep. About, 35% had regular daily physical activity. 88% of subjects reported their general health was satisfactory. 57% of teachers were subjectively happy. 70% were satisfied in their life, 7% were neutral and 23% were dissatisfied with their life.

Table 1 shows, mean DMFT score was 1.12 ± 1.41. Mean OHI-S score was 1.71 ± 1.06. Table 2 shows among PT 57% had high and 43% had low levels of extraversion (E), 55% had high and 45% had low levels of agreeableness (A), 59% had high and 41% had low levels of conscientiousness (C), 51% had high and 49% had low levels of neuroticism (N), 63% of teachers had high and 37% had low levels of openness (O). Table 3, shows PT like extraversion, agreeableness, neuroticism, openness and SH was weak and positively correlated DMFT score. C and LS is negatively correlated with the DMFT score.

Table 4, 5 shows sleep quality determining the trouble in falling asleep (p= 0.003*), general health status (p= 0.028*), physical activity (p= 0.022*), PT like neuroticism (p= 0.047*), openness (p= 0.007*),

LS (p= 0.016*) and subjective happiness (p= 0.032*) showed significant association with the DMFT scores. Gender (p=0.001*), marital status (p=0.013*), type of school (p=0.038*) and extraversion (p=0.021*) showed significant association with the OHI-S scores in multiple regression analysis.

Table 1: Distribution of oral health status among the study subjects

Factor	Categories	Respondents	
		n	%
DMFT Score	0	191	48%
	1-3	179	41%
	≥4	42	11%
OHI-S Score	Good	187	47%
	Fair	184	46%
	Poor	29	7%

Table 2: Distribution of personality traits among the study subjects

Personality Traits	High	Low
Extraversion	57%	43%
Agreeableness	55%	45%
Conscientiousness	59%	41%
Neuroticism	51%	49%
Openness	63%	47%

Table 3: Showing correlations between Personality traits, Life satisfaction, Subjective happiness with the oral health factors DMFT and OHI-S

		DMFT	E	A	C	N	O	LSS	SHS
DMFT	(r)	1	.002	.037	-.097	.112*	.083	-.143**	.093
	Sig. (2-tailed)		.964	.463	.053	.025	.098	.004	.063
OHI-S	(r)	1	.009	-.011	.006	.036	.036	-.111*	.035
	Sig. (2-tailed)		.850	.821	.901	.478	.476	.027	.484
	N	400	400	400	400	400	400	400	400

**.Correlation is significant at the 0.01 level (2-tailed)., *.Correlation is significant at the 0.05 level (2-tailed).

Table 4: Linear regression model of outcome variable DMFT

Dependent Variable: DMFT	Unstandardized Coefficients		Standardized Coefficients	P value
	B	Std. Error	Beta	
(Constant)	-1.110	.990		.263
Age	.012	.007	.090	.075
Gender	.175	.157	.057	.266
Type of School	.012	.164	.004	.941
Education	-.290	.163	-.095	.076
Maritalstatus	-.005	.169	-.001	.977
Sleep Quality	-.549	.183	-.163	.003*
Sleep trouble	-.029	.186	-.008	.874
Physical activity	.348	.152	.118	.022*
General health	.154	.070	.115	.028*
Extraversion	.073	.047	.080	.120
Agreeableness	.029	.039	.037	.456
Conscientiousness	-.021	.044	-.025	.630
Neuroticism	.076	.038	.105	.047*
Openness	.121	.045	.134	.007*
LSS	-.113	.047	-.129	.016*
SHS	.149	.069	.109	.032*

Table : 5 Linear regression model of outcome variable OHI-S

Dependent variable: OHIS	Un standardized Coefficients		Standardized Coefficients	P Value
	B	Std. Error	Beta	
(Constant)	3.077	0.769		0
Age	0.007	0.005	0.068	0.19
Gender	-0.406	0.122	-0.174	0.001*
Marital status	-0.329	0.132	-0.131	0.013*
Schooling	-0.264	0.127	-0.114	0.038*
Education	-0.157	0.127	-0.069	0.215
Sleep quality	0.109	0.142	0.043	0.443
Sleep trouble	-0.22	0.144	-0.083	0.129
Physical activity	0.097	0.118	0.044	0.41
General health	0.05	0.054	0.05	0.354
Extraversion	-0.084	0.036	-0.123	0.021*
Agreeableness	0.019	0.03	0.033	0.523
conscientiousness	0.038	0.034	0.058	0.267
Neuroticism	-0.005	0.03	-0.009	0.874
Openness	-0.002	0.035	-0.002	0.962
LSS	-0.024	0.036	-0.037	0.501
SHS	0.024	0.054	0.023	0.662

Discussion

Good health and happiness represent critical aspects of individual welfare, and their pursuit as a worthy end of one's living has been a subject of countless treatises. Personality traits imply consistency and stability. Trait psychology rests on the idea that people differ from one another in terms of where they stand on a set of basic trait dimensions that persist over time and across situations. The most widely used system of traits is called the Five-Factor Model. This system includes five broad traits Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism.

Extraversion indicates how outgoing and social a person is. In the present study, highly extraversive teachers were relatively happier than introversive, and had increased prevalence of oral diseases. Teachers who were friendly, participate actively in social events and may not spare time to take care of their oral health. Agreeableness is the tendency to be friendly, compassionate and cooperative with others. In the present study, agreeableness was not significant but weak and positively correlated (r= 0.037) to DMFT scores. Teachers with high levels of agreeableness had high caries which could be due to lack of time and self assessment in them. Teachers with high agreeableness had good oral hygiene. It is in contrast to the study conducted by Mesharam et al [8], which suggested that there exists no correlation between various personality traits and oral hygiene.

Conscientiousness implies a desire to do a task well. They tend to be efficient and organized as opposed to easy-goingand disorderly. Conscientiousness and DMFT were not significantly but weak and negatively correlated (r = -.097). Conscientiousness people are more likely to make and keep medical appointments, and they might notice sooner when something is wrong in their oral health. In spite of this lack of time in these personalities may be the reason for poor oral hygiene.

A person who is high in neuroticism has a tendency to easily experience negative emotions. Teachers high in neuroticism were constantly worrying for small things showing negative emotions. In the present study, neuroticism, was significant and positively co related (r =.112, r = 0.036) with DMFT values and OHI-S. As teachers fail to cope with the stress levels it causes poor oral health in them. It is similar to the study conducted by Takeshita et al,[7] where neurotic individuals consistently report worse self perceived health. Personality trait openness, indicates the extent of open-mindedness in a person. A person with a high level

of openness to experience in a personality test enjoys trying new things. Dental caries and high plaque and calculus scores doesn't cause any symptoms initially, leading to negligence towards oral health.

Life satisfaction is the way people show their emotions and feelings (moods) and how they feel about their directions and options for the future. Life satisfaction when correlated with DMFT and OHI-S showed significant and negative correlation (r= -.104, r= -.111) with DMFT. Those teachers who are satisfied in life had less dental caries. This might be attributed to the fact that they maintain a healthy lifestyle and take care of their oral health

Oral health outcomes have the potential to influence happiness. Yoon et al[9] found a significant relationship between oral health related factors and happiness among an elderly Korean sample. In the present study, DMFT was weakly but positively correlated with happiness, though it was not statistically significant. This shows poor awareness and negligent attitude towards oral health among school teachers. In a recent study of Romanian medical students, researchers noticed a strong correlation between gum health and participants' reports of overall life satisfaction. The present study has certain limitations. As there was self reporting of the general health and subjective happiness it might have created improper opinions owing to inhibitions in them. Oral hygiene behaviors like brushing habits of the teachers were not recorded which might have provided the major clue in estimating their oral health status.

14% of the variation in DMFT was explained by all the various predictor variables. With respect to OHI-S 9% of the variation was explained by all the variables. Evidence shows that individual thoughts, perceptions have an influence on general and oral health. Longitudinal research has to be conducted as personality traits are genetic and they may change over time.

Conclusion

There exists a significant association between personality traits and satisfaction in life of teachers with their oral health. Personality traits act as indirect modulators of the state of oral health. Satisfaction with life will improve the quality of life and wellbeing of individuals.

Ethical Clearance: Institutional Review Board of Sri Sai College of Dental Surgery.

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Effect of Structured Exercise Programme on Pulmonary Function and Physical Performance in Geriatric Population

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Abstract

Objectives: The objective was to evaluate the effect of structured exercise programme on pulmonary function and physical performance in geriatric population.

Methodology: Ethical clearance was obtained from the Institutional Ethical Committee, KIMSDU, Karad. A total of 61 subjects between 60-80 years of age, who were able to ambulate independently and able to understand instructions, who did not suffer from any musculoskeletal, neurological or cardiopulmonary disease were given structured exercise programme which consisted of warmup and cool down period along with resisted training, treadmill walking and static cycling for 4 weeks duration (5times/week). The subjects were assessed using Pulmonary function test (PFT), six minute walk test (6MWT) and Short Form 36 (SF-36) Health- related quality of life questionnaire before and after intervention.

Results: Statistical analysis was performed using Paired t- test. The results showed significant difference in all three measures that is PFT Values (FVC, FEV_1 and FEV_1/FVC ratio), 6MWT with p value of <0.0001 and SF-36 questionnaire with the p value of <0.0005 when compared between pre and post intervention results.

Conclusion: It can be concluded that structure exercise programme on physical performance and pulmonary function along with health-related quality of life in geriatric population has shown significant improvement when assessed with 6 MWT, PFT and SF-36 questionnaire.

Keywords: *Pulmonary function, physical performance, structured exercise programme.*

Introduction

Aging is characterized by the progressive organ system and tissue degeneration. It is mainly determined by genetic and influenced by a variety of environmental factor such as diet, physical exercises, micro-organism exposure, pollutants and harmful ionizing radiation.[1] The Indian geriatric population is currently the second largest in the world[2]. The elderly population is divided in to three subgroups people between 65-74 years are termed as young elderly, people between 75-84 years are classed as Old elderly, and above 85 are Old elderly[3]. Healthy ageing has been defined as the ability to lead a healthy, socially acceptable lifestyle relatively free from illness or disability, and this is more seen in those actively engaging in activities to improve their health and wellbeing[4]. The aging causes reduction in overall physical fitness i.e strength, endurance, agility and flexibility resulting in limitations in ADL and normal functioning in elderly.

Physiological Changes Due to Aging: Sarcopenia is defined as the loss of muscle strength and muscle mass leading to functional impairment that occurs with aging[5]. Sarcopenia results from decreased physical activity with aging appears to be the key factor[6]. Osteoporosis is the skeletal disorder which causes decrease in

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bone mass leading to mechanical failure of skelet al. Hormonal factors play important role in development of osteoporosis and it affects women more than male due to menopause[7]. Physical activity contribution to good physical and psychological health at all ages[8]. All this again results in decreased physical performance in elderly population.

The functional residual capacity also increases with age but is opposed by increased stiffness of the chest wall[9]. Around 50 years of age, there in increase in diameter of alveolar ducts due to degeneration of elastic fibers around them. This causes closure of small airways during breathing, hyperinflation hence senile emphysema. With ageing there is change in the surface area which causes decline in diffusion capacity of lung. Due to loss of surface area along with decrease in pulmonary capillary blood volume there is decrease in ventilation to perfusion ratio in elders[10].

World health organization (WHO) has published certain guidelines on what are the benefits of physical activity in geriatric population. Based on this guidelines, exercise is an efficient and cost effective way of improving older people's functional capacity. Strength training, balance training and flexibility exercises are the most effective in preventing falls in elderly populations[11].

Method

The Present study was experimental which was conducted on 61 geriatric subjects with the age group between 60-80 years out of which 41 were male and 20 were female. Before commencement of this study Ethical Clearance was obtained from Institutional Ethical Committee of KIMSDU, Karad. The subjects who fulfilled the inclusion. Both gender, Age group between 60-80 years, Subjects willing to participate, Decreased PFT values considered normal for their age, Reduced air entry and chest wall mobility and exclusion criteria Subjects with neurological disorder, Subjects with hearing and vision impairment, Subjects with any vessel disease, Subjects with previous history surgery within one year, Uncooperative patients were included in this study through consecutive sampling method. This study was carried out in the time period between July 2018- February 2019 Subjects were explained about the procedure of the study in detail and informed consent were obtained from them. The subjects were assessed for physical performance and pulmonary function using six minute walk test, pulmonary function test and SF-36 questionnaire pre and post intervention. The subjects were given a set of structured exercise programme for 4 weeks, 5 times/week for 60 minutes including rest periods.

The Warm-up and cool down exercises included:- Static stretching: Static stretching was given for major muscle group mainly for pectoralis, Biceps, Triceps, hamstrings and quadriceps muscles. The warm-up exercise was done for 5 minutes and cool down exercise for 5 minutes. Dynamic stretching: Front leg swings, hug into chest expansion, arm push back, March and reach. Strength training: strength training was given with theraband exercises, squats, wall pushup. This exercises were given for major muscle groups of upper limb and lower limb at 40-80% of this strength. Aerobic training: Static Bicycle the subject cycled for 7 minutes with no resistance added to cycling. Rest is given if needed by participants. Treadmill walking:- subject walked at their own pace staring at 0.1km/hr till maximum speed till end of 7 minutes. If subject wanted rest in between 1 min rest was given. All vitals were measured before and after exercises.

Outcome Measures: Six minute walk test (6MWT)-intergroup comparison (within group) using paired t-test

Table 1 showed the comparison of mean and standard deviation of pre and post values within group

In this present study pre-interventional six minute walk distance showed the Mean of 313.6±86.26 which was improved post-interventional to mean of 352.65±96.54. The p value by paired t-test was found to be <0.0001 which was extremely significant.

Pulmonary Function Test (PFT) – intergroup comparison (within group) using paired t test

Forced vital capacity: Table 1 FVC showed the Mean 1.98±0.61 pre-intervention which was increased and post-interventional to mean of 2.16±0.62. The intra-group analysis was done using paired 't' test within the group. The post-test interventional analysis considered very significant difference within the group with P value 0.0015.

FEV_1: Pre-interventional Forced Expiratory volume in 1sec showed the mean of 1.43±0.50 and post-interventional FEV_1 showed improvement with mean of 1.59±0.52. The intra-group analysis was done using paired 't' test within the group. The post-test interventional analysis showed extremely significant difference within the group with P value 0.0009

FEV_1/FVC: Pre-interventional Forced expiratory volume in 1sec/Forced vital capacity showed the mean of 70.3±11.4 and post-interventional FEV_1/FVC showed improvement with the mean of 75.3±7.75 The intra-group analysis was done using paired't' test within the group. The post-test interventional analysis showed extremely significant difference within the group with P value < 0.0005.

SF-36 QUESTIONNAIRE (SF-36): Table 3 Pre-interventional SF- 36 questionnaire showed the mean of 0.52±0.11 and post-interventional SF 36 questionnaire showed the mean of 0.66±0.11 The intra-group analysis was done using paired't' test within the group. The post-test interventional analysis showed extremely significant difference within the group with P value < 0.0005

Table 1: Comparison of six minute walk test (Distance Covered)

6MWT (Distance covered)	Pre-intervention	Post-intervention	P value	Inference
Mean ± SD	313.65±86.26	352.6± 96.54	<0.0001	Extremely significant

Table 2: Comparison of PFT values pre and post intervention

Pulmonary function test	Mean ± SD		P value	Inference
	Pre-interventional	Post-interventional		
FVC	1.98±0.61	2.16± 0.622	0.0015	Very significant
FEV_1	1.43±0.50	1.59±0.52	0.0009	Extremely significant
FEV_1/FVC	70.39±11.45	75.32±7.75	0.0005	Extremely significant

Table 3: Comparison of PFT values pre and post intervention

SF-36 questionnaire	Pre-interventional	Post- interventional	P values	Inference
Mean ± SD	0.52±0.11	0.66±0.11	<0.0001	Extremely significant

Discussion

Ageing is a phenomenon and not a disease that causes general decline in function which leads to inactivity and risk of developing disease[12]. As aging progress, there is measurable decline in the physiological function of respiratory system like reduced forced vital capacity and forced expiratory volume in one second, with increase in residual volume and functional residual capacity[13]

A structured exercise programme involves multiple component which includes strength training, exercise to improve cardio-vascular endurance[14]. Structured exercise are recommended by American college of sports medicine for optimal aging, minimizing the adverse effect of aging, reducing risk of disease. In this study strength training was given through theraband for major muscle groups, wall-pushups. Aerobic exercises including treadmill walking and static cycling along with warm-up and cool-down exercises. There was a study done which state that 6 MWT helps to evaluate the exercise capacity in elderly people[15]. In this study Six minute walk test was performed before the administration of exercise programme by the participants. The intra-group analysis was done using Paired 't' test with the p value <0.0001 which was considered extremely significant. The finding of this study correlates with the study of Santakumar Haripriyal et al who stated that multicomponent exercise program causes significant improvement in 6 MWT values[16]. In their study the outcome measures used were 8-foot up and go test for functional mobility, 6 MWT for exercise capacity and SF-36 questionnaire for health related quality of life and in this study instead of 8-foot up and go test PFT were used to assess Pulmonary function. Their study duration was 10 weeks which was long than this study which was only 4 weeks.

Aging negatively correlates with pulmonary function[17]. Pulmonary function has also show to decline with aging, in this study pulmonary function was examined prior to the intervention through forced vital capacity, forced expiratory volume in one sec and forced expiratory volume in one sec/forced vital capacity ratio. There was significant improvement in FEV1 with the p value <0.0009, FCV with the p value

<0.0015 and FEV1/FVC ratio with the P value <0.0005 after the intervention of 4 weeks which correlates with the study of Mahtab Moazamil & Samaneh Farahati who concluded that there was improvement in PFT values after aerobic training in postmenopausal women[13]

Health-related quality of life was assessed using SF-36 questionnaire which showed significant improvement after exercise programme with P value <0.0001 this findings correlates with the study of Dhanesh K who stated that 10 week multi-component exercise program which compromised aerobic, resistance, balance and functional training significantly improved that the health related quality of life[16].

Conclusion

The present study provided evidence to support the use of structure exercise programme for improving physical performance and pulmonary function along with health-related quality of life in geriatric population.

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Comparative Evaluation of Depth of Cure of Bulk-fill Composite Resin and Alkasite Restorative Material by Vicker's Hardness Test

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Abstract

Background: This study evaluates depth of cure (hardness ratio) of a bulk-fill resin composite and an alkasite material in self cure and dual cure mode and compares and evaluates the Vicker's hardness and depth of cure of a bulk-fill resin composite and an alkasite material in self cure and dual cure mode.

Materials and Method: A dual-cure alkasite material and a bulk-fill composite resin were divided into three parts: Group A- bulk-fill resin composite, Group B- self-cured alkasite material and Group C- light-cured alkasite material. The samples were prepared in a stainless steel split mould of 6mm height and 4mm diameter. Vicker's hardness testing was performed to evaluate depth of cure of 4mm at three levels of 0mm, 2mm and 4mm.

Results: The statistics were analyzed using SPSS Software and One- way ANOVA and Post Hoc tests. The data obtained revealed that Cention N showed the greatest depth of cure in dual cure mode.

Conclusion: Most dual cure restorative materials exhibit better strength post light-curing compared to only the self-cure mode.

Keywords: *Alkasite, bulk-fill resin, composite, depth of cure, Vicker's hardness.*

Introduction

The rationale of this study was to compare and evaluate the claimed depth of cure of 4mm of bulk-fill restorative materials; an alkasite cement cured by itself and dually, with a bulk-fill composite resin.

Resin based composites require isolation, necessary steps for enamel and dentin etching, priming, and bonding, and the gold standard thickness of each increment of 2 mm. However, deeper preparations with 2-mm increments are time consuming and relatively technique sensitive. The validation for this incremental technique is to warrant the penetration of the curing light deeply enough to initiate and complete the curing of the resin, apart from reducing the shrinkage and shrinkage-induced stress associated with polymerization of resin based composites. Recently, the introduction of resin-based bulk-fill composites claim to fill cavities up to 4–6 mm immediately.

Dental bulk-fill resins are increasing in demand, but the clinicians doubt that the in-depth cure may be insufficient. An alternative is possible through newer dual-cured resin based composites that not only save critical clinical time but also provide bioactive properties. Apart from new photo-initiators[1], the given techniques improve the depth in light-cured bulk-fill

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resin based composites by reducing the filler–matrix interface by enlarging the filler size[2] and decreasing the amount of pigments. Apart from fast curing and sufficient strength in large increments, modern bulk-fill resin based composites also necessitate the need for an additional feature to make it more acceptable, namely, bioactivity or self-adhesiveness.[3]

The increasing demand for a quick restorative procedure with light-cured, bulk-fill composites raises a doubt whether an adequate depth of cure will be achieved.[4] This factor, along with the trial to offer an aesthetic, basic filling material has proved to be the motivation for the launch of several dual-cure resin based composites in the market, that are also appropriate for a bulk-filling procedure. The bulk fill resin materials also concentrate on bioactive properties that intend to prevent tooth demineralization by releasing acid-neutralizing ions and aid in remineralization. For this sole purpose, one method implemented the addition of alkaline fillers in a methacrylate resin matrix, by introducing a new material category—the alkasites.[5]

Dual-curing resin based composites consists of mixing two components together, each of which, consists of a different initiator system. Currently, dual-cure resin based composites have been mainly used in modern dentistry for core build-up and cementation. However, it needed to be confirmed whether the self-curing polymerization reaction was enough not only in case of impeded light transmittance, but also in the absence of light. On comparing the features of resin based bulk fill composites that were either self-cured or dual-cured, it was found that the impact of light irradiation depended on the final material ranging from no- impact to high-impact.[6] Hence, the concluding factor for a newer dual-cured alkasite cement, apart from its caries preventive ability, is the duration it takes to set, the adequacy of its mechanical properties and early strength, the degree of conversion in depth, and the impact on the properties of the final material with additional light-curing.

The polymerization that is light-initiated facilitates the curing of a material on demand, whereas the polymerization procedure through a redox activation occurs slowly in comparison and may not be conducive enough for a quick restorative procedure that is generally required in modern clinics. The time required to set the material in question should be calculated and adjusted to the required time of a regular clinical treatment, even in the absence of light. Furthermore, the higher refractive index of alkaline fillers when compared to regular silicate glass fillers may alter the filler/resin refractive index match that is crucial for better light transmission for optimum depth. The result would be a more dense material that is able to camouflage the oral cavity or the tooth's structural discolorations effectively rather than the one obtained through several translucent, light-cured, bulk-fill resin based composites.

Materials and Methodology

A dual-cure alkasite material (Cention-N, Ivoclar Vivadent AG, Schaan, Liechtenstein) and a bulk-fill composite resin (Filtek^{TM} Bulk-Fill Posterior Restorative material, 3M^{TM} ESPE, St. Paul, USA) were selected for the study. The materials were divided into three parts: Group A - bulk-fill resin composite, Group B- self-cured alkasite material and Group C - light-cured alkasite material.

A stainless steel split mold of height 6mm and diameter 4mm was used to prepare 10 Samples from each group.

Group A (Cention N-Self Cure) - Powder and liquid was dispensed onto a paper pad in the ratio of about 4.6:1, mixed for about 45-60s and condensed into the mold. They were retrieved after 5 minutes of setting time.

Group B (Filtek Bulk-Fill) - The samples were condensed into the mold and cured for 20 seconds with blue LED Light Source.

Group C (Cention N-Dual Cure) - The powder and liquid was mixed and the cement loaded into the mold to be cured. The samples were cured for 20 seconds with blue LED Light Source (Kerr Demi^{TM} Ultra Ultracapacitor-1200 mW/cm^2) and were retrieved immediately after the curing cycle was complete. The samples were all thermocycled (Thermocycler SD Mechatronik, GmbH Dental Research Equipment, Germany) for 5,000 cycles at 5°C and 55°C (dwelling time: cold bath, 30 seconds; hot bath, 30 seconds).

The Depth of cure was measured by Vicker's Hardness Testing Machine (MMT- X7A, Matsuzawa Co., Ltd., Japan).

Results

The statistics were analyzed using SPSS Software 16.0. One- way ANOVA statistical tests were done to

compare the three groups and on achieving statistically significant results, Post Hoc test was done.

The results obtained (Table I) showed that Group C (Cention N- Dual Cure) had manifested the most coveted results in comparison to the other two groups. Group C showed best results at all three levels of 0mm, 2mm and 4mm.

Group C had the highest VHN value of 65.08 followed by Group B at 54.63 and lastly group C, at 43.87 and the surface layer of 0mm. Even at the claimed depth of 4 mm, Group C did better with the VHN value of 49.86.

Table I: Vicker's Hardness Numbers of Group A, B, C at 0, 2 and 4 mm.

Group	Depth	Sample Size (n)	Mean	Standard Deviation
Group A – Cention N - Self Cure				
	0 mm	10	43.87	0.881
	2 mm	10	39.94	0.910
	4 mm	10	32.45	0.820
Group B – Filtek Bulk- Fill				
	0 mm	10	54.63	0.834
	2 mm	10	48.23	0.824
	4 mm	10	41.35	0.921
Group C – Cention N- Dual Cure				
	0 mm	10	65.08	0.820
	2 mm	10	57.31	0.748
	4 mm	10	49.86	0.625
The mean difference is significant at $p<0.05$.				

Discussion

Currently, bulk-fill resin based composite materials has gained popularity among practitioners owing to the comparative simplicity of the procedure.

Manufacturers, with the help of advanced technology, relate the modifications in the filler content and/or organic matrix as their claim in the main advancement of bulk-fill composite materials i.e, namely increased depth of cure, which probably results from higher translucency, and low polymerization shrinkage stress

Cention N contains an acyl phosphine oxide initiator (Norrish type1 initiator) which requires just one component for radical formation and the photoinitiator, Ivocerin. The presence of this leads to faster polymerization of the resin material and causes better conversion of the monomer to polymer which may have lead to the results developed in this study. Cention N also contains UDMA, DCP, and an aliphatic/aromatic UDMA; which has claimed faster cross-linking of the methacrylate monomers to a high polymer network density and may be responsible for the better depth of cure.[7]

A self-curing material with options for light-curing outlook is the substance of analysis. Although the initiation rate can be very high in the light-curing mode, its significant drawback maybe the fact that the saturation of light energy in depth is quite low. In order to improve this, the alkasite was modified and a redox activation containing a copper salt, a peroxide and a thiocarbamide was added in the powder component.[7]

The use of restorative and viscous composite resins has demonstrated that greater depth of cure up to 4 mm is more effective.[8,9] It has been found that filler size and content in dental composites may reduce light penetration and this, in turn, has an effect on the depth of the cure.[10,11] The pigments present in shaded composite materials have a direct impact on the depth of cure since these are dense particles that hinder the penetration of light and decrease the degree of polymerization at greater depths while a cavity is being treated.[12]

Filtek Bulk-Fill claims to contain AFM (addition-fragmentation monomers) that react with the methacrylate to keep the physical features of the material intact. The kind of monomers being used have an effect on the Methacrylate composites as they have the ability to shrink in varying degrees during polymerization. Filtek Bulk Fill Posterior Restorative consists of two new methacrylate monomers; their properties have served as a catalyst to gain lower polymerization stress that is necessary for better results.

Filtek bulk fill (bulk fill viscous composite) has shown a higher degree of conversion than the conventional viscous composite. Probably the reduced filler volume fraction is convenient compared to the less viscous conventional composite.[13] The composition of 4 high molecular weight monomers, viz. Bis-GMA, Bis-EMA, UDMA and procrylate in Filtek bulk fill facilitates a higher conversion and Depth of cure . Filtek bulk fill flow composites contain a proprietary monomer equivalent to Bis-GMA and patented as Procrylat resin.[14] Procrylat is a high molecular weight monomer with low viscosity similar to Bis-GMA but with a lower viscosity, the lack of pendant hydroxyl groups is the only difference between Bis-GMA and Procrylate.[15]

The decreased hydrogen bonding potential is due to the lack of hydroxyl group which reduces the viscosity of the monomer. Also Bis-EMA and UDMA are high molecular weight monomers with low viscosity so the manufacturers adjust the proportions of the 4 high molecular monomers to decrease viscosity and create hard cross link network.[16]

The monomer aromatic dimethacrylate (AUDMA) with a high molecular weight is responsible for reducing the number of reactive groups in the resin. Polymerization stress is caused mainly due to two factors – the shrinkage in the volume and the stiffness in the developing and final polymer matrix. However, AUDMA is capable of combating both these factors.

Another distinctive methacrylate characterizes a class of compounds called addition-fragmentation monomers (AFM). The AFM reacts like any other methacrylate by forming cross-links between the adjacent polymer chains during the process of polymerization. The third reactive site of the AFM splits into fragments during polymerization. This process provides a technique to relax the developing network that results in greater relief from the stress caused. The fragments, however, still preserve the feature that can not only allow them to react with each other but also with other reactive sites of the developing polymer. Thus the physical features of the polymer are retained along with relief from stress.

Conclusion

Under the limitations of this study, Cention N showed best depth of cure when tested by the Vicker's Hardness Test in dual cure mode. Filtek bulk fill also showed coveted results while maintaining a desirable depth of cure. In self-cure mode, Cention N may not achieve enough curing and we recommend that the alkasite material be used along with light curing protocols.

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Conflicts of Interest: There are no conflicts of interest with this study.

Ethical Clearance: This was an in vitro dental material based study and did not require ethical clearance from the ethical committee.

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Population Growth and its Impact on Public Health in India: A Legal Analysis

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Abstract

In this article the author after a thorough research on population growth strives to pen down the major factors that envelope the matter of population explosion in India only. The author beautifully states the occurrences of change year wise through the family welfare programs planned and implemented in India along with the consequential changes that took place because of such programs. The National Population Policy, Role of National Commission on Population have been discussed as well followed by the impact of the same on Public health. Most importantly the measures that were taken to control such fast growing population in India have been individually dealt with in order to provide a in depth knowledge to the readers of this article. However the author hopes to have dealt with the matter sensitively and in simple language as well, so as to satisfy the needs of the reader on the mentioned topic.

Keywords: *Population, public health, fertility, family welfare program.*

Introduction

India firstly adopted the population control policy as a matter of national concern before 1951. The goal of the year 1951 was that "the country was working on stabilizing the population at a level consistent with the needs of the national development." The problem of population explosion in the country is considered to be the biggest and most fundamental problem which India is facing till date. Why is it that this matter of population turns out to be the biggest problem an the other major problems like poverty, environmental degradation, unemployment etc are more or less overshadowed by this so called fundamental problem. There is no doubt that the pace and momentum in which population growth is taking place today might very soon lead to disastrous situations due to scarce of food, water and shelter etc. Moreover as we see today water has already become a matter of concern in India.[1]

Development of India's Family Welfare Programs: In the Year 1950: When India achieved independence at that time the country's health care services relating to hospitals were predominately available in the Urban areas only. Rural India at that stage seemed to be very underdeveloped. The general physicians were well versed with the women and child health services. In the year 1951, India became the first nation to develop a state sponsored family planning program in the National Family Planning Program. The main goals of this program are to lower the fertility rates and to slow down the population growth as a means to drive the economic development.[2]

This national program was based on 5 ethical goals such as, "the community must be prepared to feel the need for the services in order that, when provided, these may be accepted, parents alone must decide the number of children they want and their obligations towards them, people should be approached through the media they respect and their recognized and trusted leaders and without off-ending their religious and moral values and susceptibilities, services should be made available to the people as near to their doorsteps as possible, services

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have greater relevance and effectiveness if made an integral part of medical and public health services and especially of maternal and child health programs."[3]

In the Year 1960: In the year 1960 many useful medicines which are beneficial for the prevention of six childhood diseaseand for effective contraceptives for birth also became available. The family welfare program and various immunization programs were among the primary programs which were added the national policy. During this ear sterilization remained the aim of the national family planning program. Several awareness programs and efforts were made for the promotion of vasectomy and to provide services exclusively to the rural peoples.

In the Year 1970: However in the year 1970 population explosion was though not considered as the chief threat to the nation but many troubles due to increased population were emerged. The government of India had given main concern to this problem. The parliament of India has enacted a legislation namely The Medical Termination of Pregnancy Act, 1971which can check unwanted pregnancy of women and to get a safe termination of pregnancy after fulfilling the requisite conditions of the law. In this era it is reported a massive sterilization drive done in the year 1976 which is near about 8 million persons.[4]

In the Year 1980:The chief thrust in the year 1980 was to implement the WHO's "Alma Ata Declaration of Health for all by the year 2000 through establishing a network of health care centre's in urban and rural areas." In the year 1986 a Universal Immunization Program started in 30 districts and subsequently it was extended to cover 448 districts by the end of Seventh Plan.[5]

In the Year 1990: In the year 1990 with the starting of Eighth Plan, several efforts were made under "Safe Motherhood and Child Survival and the Social Safety Net Program" to enhance the access to motherhood and childhood health care services.

National Population Policy: A proficient committee headed by M.S. Swaminathan who was appointed by the government to draft a National Population Policy and finally it came into operation from year 2000. The said policy has set out few goals for the year 2010 such as; "to address the unmet needs for basic reproductive and child health services, supplies, and infrastructure; to make school education up to age 14 free and compulsory, and reduce dropouts at the primary and secondary school levels to below 20 per cent for both boys and girls; to reduce the infant mortality rate to below 30 per 1,000 live births; to reduce the maternal mortality ratio to below 100 per 100,000 live births; to achieve universal immunization of children against all vaccine preventable diseases; to promote delayed marriage for girls, not earlier than age 18 and preferably after 20 years of age; to achieve 80 per cent institutional deliveries and 100 per cent deliveries by trained persons; to achieve universal access to information/counseling, and services for fertility regulation and contraception with a wide basket of choices; to achieve 100 per cent registration of births, deaths, marriages, and pregnancy; to contain the spread of the Acquired Immuno-deficiency Syndrome (AIDS) and promote greater integration between the management of reproductive tract infections (RTIs) and sexually transmitted infections (STIs) and the National AIDS Control Organization; and to prevent and control communicable diseases."[6]

National Commission on Population: On May 11, 2000 under the chairmanship of Prime Minister, The National Commission on Population was constituted along with Chief Ministers of all the states, concerned ministers of the related central ministries, secretaries of the concerned departments, distinguished physicians, demographers and the representatives of the civil society are members of the commission. The commission has given the mandate such as, "to review, monitor and give direction for implementation of the National Population Policy with the view to achieve the goals set in the Population Policy; to promote synergy between health, educational environmental and developmental programs so as to hasten population stabilization; to promote inter sectoral coordination in planning and implementation of the programs through different sectors and agencies in center and the states; to develop a vigorous peoples program to support this national effort."

Impact on Public Health: The degree and accentuation of a general wellbeing or public health program are essentially impacted by the changing attributes of the populace it serves. Among the different attributes of ongoing population explosion patterns, aging of the populace is a standout amongst the most major in its bearing on national public health.

Human health is in danger as the denser the populace; the simpler airborne ailments can spread.

The increment in overpopulation has prompted issues like urban swarming and ecological changes that have brought about the development of numerous irresistible diseases. Increment in antimicrobial obstruction turns out to be a sudden issue for illnesses, for example. Tuberculosis, Malaria, Cholera, Dengue fever etc.

The overpopulation also results in the contamination and pollution of water. People also die each year due to contamination of water related diseases. Because the virus spreads faster in water than any other platform.

This population growth also explodes the number of vehicles in the society. Due to vehicular use air in the environments degrades by toxic contents and it affects easily with children and older persons. They suffer from various respiratory diseases like Asthma,Lung cancer, Chest pain, Congestion, Throat inflammation, Cardiovascular disease etc.

Rapid population growth has also led to affect of ozone layer. The UV rays of the sun which causes various skin problems like skin cancer and premature aging of skin. It also results in the eye problems like cataract and sometimes it leads to blindness.

Checking Overpopulation: The government has taken various measures to put a check on overpopulation. Only legislation, rules and regulations cannot only put an end to population however medical assistance through proper sterilization can control this problem in India.

Therapeutic Sterilization: This type of sterilization is performed where a person is of sound mind gives consent to such operations. This is very common in the world. A medical practitioner when performed this type of sterilization with the consent of the patient having very less chance of criminal prosecution. However if it is done without the consent of the spouse then r this may rise to civil liabilities. This is civil liabilities because of the The Hindu marriage Act, 1955 which is a ground for divorce under the purview of cruelty.

Eugenic Sterilization: This is performed where a further procreation capacity of a mother will weaken physically and psychologically. There is no particular legislation available pertaining to eugenic sterilization in India. In most of the states of United States of America this type of legislation prescribes sterilization. However other modes of sterilization which controls the birth process should be made free and voluntary.

The Injectable Contraceptive: This type of process is a threat to life and health of the acceptor which certainly makes the mockery of her fundamental rights. This process affects women's menstruation cycle and may have bleeding and spotting between the periods.[7] It occurs mostly during the first few months of its usage but may also occur after the use of injectable contraceptive for some time. Periods and fertility may take up to a year to return after stopping injections, depending on the type of injectable, and this may vary from woman to woman.

Conclusion

After all the above discussions on population growth the author is of the opinion that if the present ruling government of India strives to strike down the unnecessary policies and programs and go for programs which would make aware the eligible couples about the numerous benefits of birth-control, policies that would provide free education to the single child of a couple, implementing strictly the laws on preventing early marriage, arranging a vigorous training program for the family welfare workers and improving the situation by implementing all the above stated suggestions majorly in the rural sectors of India would yield great results.

Ethical Clearance: Not required, as the research article is based on population explosion and its impact on public health. The research is doctrinally undertaken.

Source of Funding: Self

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Evaluation of Malondialdehyde, Glutathione Peroxidase and Defensin Levels in Patients with and without Periodontitis

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Abstract

Aim: Aim of the study is to estimate the levels of Malondialdehyde, glutathione peroxidase and Defensin levels on patients with and without periodontitis.

Materials and Method: The levels of Malondialdehyde and Glutathione peroxidase was estimated using colorimetric estimation and Defensin was estimated using ELISA

Results: Levels of Defensin is increased in patients with periodontitis 9.18+-1.72 when compared to healthy subjects 6.22+-2.73. The mean levels of MDA is increased in patients with periodontitis 2.35+-0.32 when compared to normal patients 3.58+-0.36. The levels of Gpx is lower in patients with periodontitis 2.52+-0.58 when compared to normal patients 3.58+-0.36. The p – value was found to be significant (0.001)

Conclusion: Thus, this study reveals that Malondialdehyde, Defensin and glutathione peroxidase can be considered as biomarkers in the periodontal diseases.

Keywords: *Periodontitis, oxidative stress, inflammation, saliva, tooth.*

Introduction

Periodontitis is an inflammatory disease of supporting tissues of the teeth that are caused by specific microorganisms or groups of microorganisms, which eventually results in progressive destruction of the supporting tissues of the teeth. It is also combined with periodontal pocket formation, gingival recession or both.[1] Periodontitis is a complexive disease resulting from interaction of bacterial infections and host response to such bacterial infections. Environment, acquired risk factors and genetic susceptibility are certain modification factors predisposed to this disease.[2] Periodontitis is one of the most common causes of tooth loss in adults.[3] However this can be prevented by preventing plaque and calculus formation which harbours the periodontal pathogens . The periodontal pathogens in the causal of the disease include a vast list of organisms among which Porphyromonas gingivalis, and Aggregatibacter actinomycetemcomitans, which are commonly seen in the biofilm. The colonization and subsequent invasion of these Gram-positive and Gram-negative microorganisms into the gingival epithelium leads to progression of the disease.

The severity of periodontitis could be diagnosed on the basis of its typical clinical parameters. These include periodontal probing depth, pocket depth, clinical attachment loss and amount of gingival bleeding. Moreover,analysis of saliva as an important laboratory test for the evaluation of many salivary conditions, including periodontitis, has gained attention during the last few decades.[4] Using saliva as a diagnostic marker

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for monitoring various biological alternations in human is an emerging trend worldwide. Human saliva is an easily collectable biochemical fluid, which is similar to blood in various biological aspects.It possesses a simple and non-invasive collection with low-cost storage and easily storage nature. Saliva contains both locally and systemically derived biochemical molecules with relatively important diagnostic value, which could be used for detecting periodontal diseases.[5] It can be used to assess both the severity of the disease as well as monitoring the patient's responses towards the treatment. Detection of salivary biomarkers is a non-invasive laboratory examination for early diagnosis of periodontitis.[6]

Glutathione peroxidaseis a marker of oxidative stress and dependent on the micro nutrient selenium (Se).[7] Periodontal diseases are associated with disturbances in the balance between the oxidants and antioxidants. This causes an increase in Reactive oxygen species(ROS) as well as decreased antioxidant activity in saliva.[8] Lipid peroxidation is a outcome of periodontitis. This is caused by free radicals which leads to the production of toxic and reactive aldehyde metabolites such as MDA formed by the peroxidation of poly unsaturated fatty acids.[9] Defensin is an anti microbial peptide of human flora. In case of infection or inflammation, it gets expressed on the surface of neutrophils. They also directly stimulate antigen-presenting dendritic cells and memory T-cell, and thus can link innate and adaptive immune responses.[10,11] So, this study aims at evaluating the salivary bio markers which get expressed in the periodontal diseases. The markers are Glutathione Peroxidase (Gpx), Malondialdehyde (MDA) and Defensin (beta-2) .

Materials and Method

This was a case control study performed in the Department of Biochemistry, Saveetha Dental College and Hospitals, Chennai. It was carried out in 20 subjects among which 10 patients had chronic periodontitis aged 50-70 years (group I) and 10 patients were healthy subjects (group II). Informed consent was obtained from each patient before the study.

Saliva Collection: Unstimulated whole saliva (Resting Saliva) from each participant was expectorated into sterile tubes prior to any kind of treatment.

Inclusion Criteria:

1. Presence of plaque
2. Presence of calculus
3. Generalised clinical attachment loss ≥ 4 mm
4. Probing depth more than 5mm
5. Generalised Gingival recession

Exclusion Criteria:

1. No history of systemic diseases
2. Patients who have undergone periodontal therapy
3. No history of diabetes
4. No history of hypertension

Estimation of levels of MDA and glutathione peroxidase: The levels of MDA and Gpx was determined by the use OF chemical reagents and subjecting it to colorimetric analysis with the help of a colorimeter. Colorimetric analysis is a method of determining the concentration of a chemical element or chemical compound in a solution with the aid of a color reagent

Estimation of Defensin: This was estimated using the Enzyme Linked Immunosorbant Assay(ELISA).

Results

The data was statistically analysed. The table given below shows the statistical data of the bio markers estimated in the study.

It is seen that the levels of Defensin is increased in patients with periodontitis 9.18+-1.72 when compared to healthy subjects 6.22+-2.73(Table 1).The mean levels of MDA is increased in patients with periodontitis 2.35+-0.32 when compared to normal patients 3.58+-0.36 (Table 2). The levels of Gpx is lower in patients with periodontitis 2.52+-0.58 when compared to normal patients 3.58+-0.36 (Table 3). The p – value was found to be significant (0.001). Bar Graph 1,2,3 shows the levels of Defensin, Gpx, MDA respectively among patients with periodontitis and normal patients.

Table 1: Levels of Defensin among patients with periodontitis and normal patients

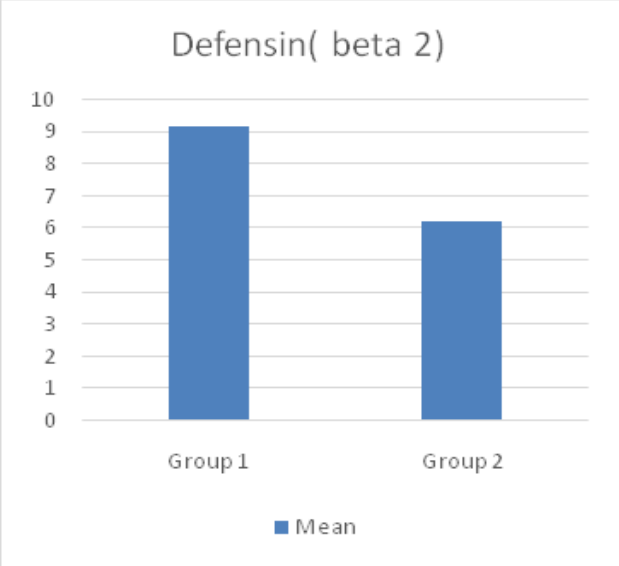
Subject	Mean	Standard Deviation	p value
Group I	9.18	1.72	0.001
Group II	6.22	2.73	

Table 2:Levels of Gpx among patients with periodontitis and normal patients

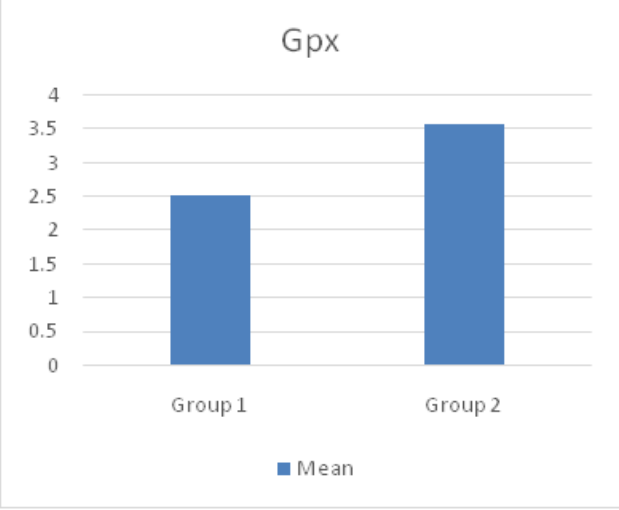
Subject	Mean	Standard Deviation	p value
Group I	2.52	0.58	0.001
Group II	3.58	0.36	

Table 3: Levels of MDA among patients with periodontitis and normal patients

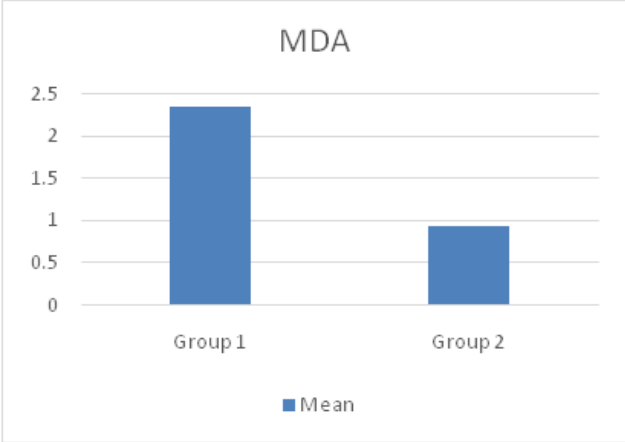
Subject	Mean	Standard Deviation	p value
Group I	2.35	0.32	0.001
Group II	0.94	0.58	



Graph 1: Graph showing comparison of comparison of levels of Defensin (beta 2). among patients with periodontitis and normal patients.



Graph 2: Graph showing Comparison levels of Gpx among patients with periodontitis and normal Patients.



Graph 3: Graph showing comparison of levels of MDA among patients with and without periodontitis.

Discussion

From the above results it is seen that the levels of Defensin beta -2 and Malondialdehyde levels are increased in case of periodontitis patients whereas the level of Glutathione peroxidase is decreased when compared to healthy subjects. The reason for the increased levels of MDA is because, in case of periodontitis, there is an imbalance between the oxidants and antioxidants present in the oral cavity which ultimately leads to the production of ROS. Therefore lipid peroxidation occurs and there is increased MDA. For patients with periodontitis there is increased oxidative stress occurs which causes reduced antioxidant activity causing the decrease of Gpx. Human defensin beta- 2 gets expressed on the surface of neutrophils which involves in innate immunity causing phagocytosis of the bacterial flora. Moreover it protects the undifferentiated stem cells of the periodontium.

Several studies have shown similar results. In a study done by Akalin et al,[12] the levels of MDA was elevated in saliva in patients with periodontitis. Lipid peroxidation causes release of ROS which causes the suitable host environment for resorption of bone, degradation of connective tissue and increase in the matrix metalloproteinase activity.[13] Dhotre et al conducted a study to find of any significant relation between the serum and salivary levels of MDA. It was reported that there was a significant increase in the levels of serum MDA in patients with periodontitis. They even concluded that this increase in the levels of MDA can be referred to the possibility of an association between periodontitis and cardiovascular disease. [14]

In accordance with the studies done to evaluate the levels of glutathione peroxidase there was varying results. In contrary to our study, A study done by Wei et al[15,] showed the levels of Gpx was increased in the gingival crevicular fluid in patients with periodontitis. Not all patients demonstrated the increased level of Gpx in periodontal diseases . For eg. A study by Brock et al[16] reported the levels of GpX was reduced when compared to healthy subjects. This indicates that there is hampered antioxidant capacity in patients with periodontitis. This study is in accordance with the our study. The levels of Gpx might have a positive correlation between the progression of disease.[17]

Human Defensin beta -2 is profoundly indicative of the antimicrobial activity occurring in the oral cavity. They play a major role in the adaptive and innate Immune responses. They provoke efficient epithelial barrier repair to limit entry of invading bacteria.[18] Related to the severity of disease, some study conducted by Ertugrul et al,[19] found that significantly higher level of HBD-2 from chronic periodontitis than gingivitis subjects ($p<0.05$) Another study by Sulijaya et al.[20] reported that HBD-2 protein level was higher in severe chronic periodontitis than other patients.

Conclusion

Thus to conclude the role of biomarkers in periodontal diseases is to prevent the onset as well as the progression of the diseases. Antimicrobial peptides provide multiple benefits as frontline defense molecules and antioxidants can provide better integration of the tissues. Nevertheless, therapeutic considerations for the adjunctive use of glutathione, defensin and the elimination of MDA in management of periodontitis can limit the tissue damage and enhance the wound healing.

Ethical Clearance: Taken from Instituitional Ethical Committee.

Source of Funding: Self

Conflict of Interest: Nil

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Effect of Neurodynamic Sliding Technique on Hemiplegic Stroke Subjects with Hamstring Tightness

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Abstract

Aim and Objectives: To determine the effect of Neurodynamic Sliding Technique On Hemiplegic Stroke Subjects With Hamstring Tightness.

Methodology: Quasi Experimental study design was used in this study. Total 20 hemiplegic subjects with hamstring tightness were selected. Then pre intervention measurements was taken using goniometer by passive SLR test on affected side. Then all subjects underwent Neurodynamic sliding technique (NDST) for 20 repetitions and 3 sets. NDST was performed for 4 week. At the end of fourth week post test measurement was taken. Then pre and post intervention measurements were taken using goniometer as per pre intervention measurement. The values were tabulated and statistically analyzed.

Results: At the end of study data were analysed the mean score of Passive SLR for hamstring pre-intervention 56.30 and post-intervention 62.55. Finally there is significant change in mean value (p & lt; 0.00).Conclusion: NDST shows minimal observable significance in hemiplegic subjects. Hence this NDST should be practiced for long term effect.

Keywords: *Neurodynamic sliding technique, hamstring flexibility, passive SLR test, Goniometer,hemiplegia.*

Introduction

Stroke occurs when an interrupted blood flow to brain, without oxygen rich blood brain cells die. Stroke is one of the leading causes of death and disability in India. Incidence: 119-145/100000 based on recent population studies. Prevalence: 84-262/100000 in rural and 334-424/100000 in urban[1]. Hamstring muscles have an important role in the performance of daily activities such as controlled trunk movement, walking, and jumping[2]. Muscle tightness is one of the commonest motor system factor which affect the balance. Tightness of calf and hamstring may affect static, dynamic balance of body and mobility[3]. Poor hamstring flexibility appears to be one accepted factor causes of hamstring injuries[4], musculoskeletal disorders and reduction in physical performance[5]. Entire nervous system in the body is a continuous structure which slides as we move and the movement shows physiological processes such as blood flow to neuron. Nerve adhesions in the hamstring may alter neurodynamics causing abnormal mechanosensitivity of the sciatic nerve; which could influence hamstring flexibility[6]. This mechanosensitivity of the neural tissue could limit hamstring length in normal healthy individuals[7]. Before stroke the brain communicated through spinal cord to the muscle when to tighten and relax to control movement. After stroke the affected brain is not able to understand the signals from the affected muscle. The signals has been not transmitted to affected part of brain it undergo safe mode. Spinal cord send its own impulse to muscle in those limb to remain contracted or tight, so that muscle

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don't get overstretched and tight hamstring limits the movement of pelvis in relation to the legs. Hamstring pull the pelvis into backward tilt, rounding and putting strain over lower back.

Several stretching method have been used to improve muscle flexibility, including the static stretching, contract-relax stretching, ballistic stretching and neurodynamic sliding technique (NDST)[8-10]. Other conservative techniques robotics to provide physical assistance, virtual reality, extra corporeal shock wave therapy, bilateral training or irradiational therapy, constraints-induced therapy functional electrical stimulation with biofeedback[11]. Neurodynamic is a manual method of stretching in which force is applying to nerve structures through posture and multi-joint movement, aiming to produce a sliding movement of neural structures relative to their adjacent tissues[12]. Neurodynamic is thought to decrease neural mechanosensitivity and can be a beneficial technique in the management of hamstring flexibility[13]. Neurodynamics change in mobility of nervous system achieved through movement and stretching could modify such sensations. NDST interventions to decrease neural mechanosensitivity, this intervention could be beneficial in the hamstring flexibility[14]. Decreased hamstring flexibility as evidenced by limited range in the passive straight leg raise test (SLR) could be due to altered neurodynamics affecting the sciatic, tibial, and common fibular nerves[15]. Altered posterior lower extremity neurodynamics could arguably influence resting muscle length and lead to changes in the perception of stretch or pain[16]. Providing movement or stretching could lead to changes in the neurodynamics and modification of sensation and could help to explain the observed increase in flexibility.

Methodology

Participants: Patients were participate in this study was screened for inclusion subjects of both the gender within the age group of 60 years or more, physically independent, not currently engaged in a structural exercise program, Able to understand and follow simple verbal instructions, and exclusion criteria Physical or functional impairments, Dementia, Alzheimer's disease, Parkinson's disease, Any Musculoskeletal disorder 20 sample was selected using convenient sampling technique. They were explained about safety and simplicity of the procedure and informed consent was obtained. This study is conducted in Saveetha College of physiotherapy OPD Thandalam, Chennai India.

Procedure: As pre-test values was noted for all 20 hemiplegic subject using goniometer measuring passive SLR of hamstring muscle. A pair of examiners needed to measure the passive ROM of hamstring flexibility. The subjects would be in supine lying with wedge is placed under upper back for thorax and cervical flexion also landmark identified and labelled marker: ASIS, greater trochanter, lateral epicondyle of femur. One examiner has to perform passive SLR test by stabilising knee extension and ankle in neutral. Heavy dorsiflexion is avoided to prevent calf muscle stiffness. Another examiner has to place goniometer on axis of hip joint. The stable arm parallel to examine table and movable arm parallel to the measuring limb by performing the passive SLR until the patient get pain over hamstrings and note down the values. All 20 subjects received neurodynamic sliding techniqueand to produce the sliding movement of neural structures to relieve adjacent tissues. Cervical and thoracic spine should be in flexed position. Alternate hip flexion, knee flexion and dorsiflexion then hip extension, knee extension and plantar flexion was performed. NDST were performed for 15 repetitions and 3 sets5 days/week for 4 weeks. Post test measurement is done after intervention.

Result

The statistical analysis revealed significant difference ($P<0.0001$) between pretest and posttest values of hamstring ROM within the group. The pretest mean value is 56.30(SD=8.84) and posttest mean value 62.55(SD=8.87). This shows that hamstring ROM of test in posttest values were comparatively less than pretest value- $p<0.0001$ and t- value is 32.8564 (Table No. 1).

Table 1: Comparison of pre-test and post-test values of Hamstring ROM

Hamstring ROM	Mean	Standard Deviation	t-value	P- value
Pre test	56.30	8.84	32.8564	<0.0001
Post test	62.55	8.87		

Discussion

The results confirmed our initial hypothesis that an isolated neurodynamic sciatic sliding technique would provide a greater immediate improvement in hip flexion, assessed by passive SLR, than hamstring stretching or placebo. Very few studies have examined the effect of neurodynamic interventions on hamstring

flexibility[17,18]. The results of this study can be seen as adding further evidence for the potential role of neural tissue mechanosensitivity in limiting the SLR[19]. There are many approaches to treat the hamstring tightness in stroke like stretching, cryotherapy, Proprioceptive neuromuscular facilitation techniques are commonly provided treatments.

While some theories explaining the therapeutic effects of muscle stretching suggest there is alteration of the viscoelastic properties of muscles, studies have shown the importance of distinguishing between real and apparent increases in muscle flexibility[20]. The pretest measurement of hamstring ROM of stroke subjects were measured with the use of goniometer then NDST is performed to the patient and post measurement of hamstring ROM values are noted with the help of goniometer. In this study NDST shows hamstring flexibility in stroke patients. There is marked significant increase in mean value from pre test to post test mean value. When they added a neurodynamic slider technique they found greater mean increases of 62.55 in the hemiplegic SLR.

Limitations of this study only examined immediate effects of a single episode and the lack of longer term follow-up should be considered. It is not known how long the observed increase in hamstring flexibility might have lasted. Furthermore, it is not known if repetition and an appropriate dosage of the neurodynamic interventions over time might lead to longer lasting effects. Finally, we did not conduct any long-term follow-up to determine if the observed changes in flexibility might have resulted in any change in incidence of hamstring injuries in these subjects with short hamstring tightness in stroke subjects. Further recommendation of the study is long term intervention in neurodynamic sliding technique. And also relatedly with other techniques were included in future study.

Conclusion

These results show that the Neuro dynamic sliding is an acceptable and effective intervention for stroke to promote improvements in important aspects of hamstring flexibility and Range of motion in a sample of stroke subjects. NDST shows minimal observable significance in hemiplegic subjects .Since there is marked clinical outcomes with this immediate technique, Hence this NDST would be practiced for long term effect. Mean value of pre test and post test.

Ethical Consideration: The study was approved by Institutional Ethics committee (017/12/2018/IEC/SU on 27/12/2018) and was done in accordance with Ethical Guidance for the Human Participants. This study protocol was approved by institutional Ethical committee.

Conflict of Interest: Nil

Sources of Funding: Self

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To Compare the Flexural Properties of Three Commercially Available Heat Cure Denture Base Resins After Water Immersion Over a Period of Three Months: An in Vitro Study

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Abstract

Aim: To evaluate and compare the flexural properties of three commercially available brands of PMMA heat cure denture base resins after water immersion over a period of 3 months.

Method and Material: Commercially available heat cure denture base resins (DPI, Triplex, and Trevalon) were used in the study. An aluminum die was fabricated according to ISO 1567. Each of the tested materials was manipulated according to manufacturer's instructions. Total of 60 samples were made (n=10). With 3 control (dry) groups and three experimental (water immersed) groups. The samples were subjected to INSTRON universal testing machine.

Statistical Analysis Used: Student 't' test, ANOVA and Post hoc tukey's test.

Results: Student 't' test indicated that there is significant difference in the flexural properties of the denture base resins after long term water immersion with $p<0.05$ for all the three groups. ANOVA indicated that there was no significant difference among the three groups/brands.

Conclusions: The flexural properties of heat cure denture base resins was affected by long term water immersion. The ultimate flexural strength decreased, flexural strength at proportional limit remained same and modulus of elasticity decreased. Thus after long term water immersion, the denture base material becomes weaker and stiffer.

Keywords: *Denture base resins; Flexural strength; tensile strength; elastic modulus; Water sorption; Water immersion.*

Introduction

Acrylic resins were acquainted to dentistry in 1937[1,2] and since that time, none of the materials equaled the appearance of the oral soft tissues with such pronounced reliability as acrylic resin. The acrylic resins are now commonly used in the fabrication of complete & partial dentures, various other intraoral and extraoral prostheses and has an acceptable overall performance.

Skinner and Cooper[3] suggested that a minor lack in dimensional stability must be accepted as one of the short comings of acrylic resin dentures, with shrinkage and expansion being the two unavoidable glitches.

For acrylic prostheses to thrive effectively in a hostile oral environment, it should possess acceptable mechanical and physical properties, i.e. flexural strength, hardness, water sorption, solubility.[4,5] Physical and mechanical properties may vary among different groups of acrylic resins, which is a result of differences in their

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chemical structure and the cycle of polymerization process.[6-9] In addition to distortions which may occur due to thermal softening or release of internal stresses other mechanism such as water sorption may also contribute to dimensional instability as well[10].

A usual weakness of the denture base polymers with respect to fatigue is the flexural strength, which limits its use in demanding clinical situations.[11,12] Studies[13] have been conducted to evaluate the relationship between the flexural strength and the period of water immersion showing a significant decrease in the flexural strength at proportional limit for the denture reline materials when the duration of water immersion was increased from 1 to 30 days. Further studies[14] also exhibited flexural strength at proportional limit remained constant after water immersion.

Other studies also showed that the ultimate flexural strengths and flexural moduli of dry specimens of acrylic resin composites had decreased after 48 weeks of water immersion[15] and fiber reinforced composites after 10 years of water immersion[16].

Some studies have been done investigating the relationship between the mechanical properties of denture polymers and the water immersion period[13, 15-17] however, to best of our knowledge, there is insufficient information to systemically evaluate the effect on the flexural properties of denture immersed in water over a longer period.

In this context, the purpose of this study was to investigate the flexural properties of three brands of commercially available denture base resins subjected to water immersion over a period of three months.

Subjects and Method

The study was directed to evaluate and compare the flexural properties of three commercial brands of Poly methylmethacrylate (PMMA) heat cure denture base resins after water immersion over a period of three months. Efforts were made to select and utilize standard method and materials.

Preparation of the Master Die: Aluminum Master Die of dimension 65×10×3 mm^3 (figure 1) was fabricated using a Milling Machine in accordance with ISO 1567:1999, International Organization for Standardization, Geneva, Switzerland, 1999 for Denture Base Polymers.[18]

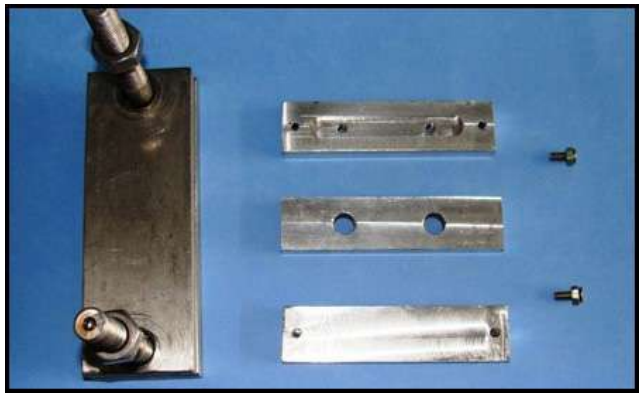

Figure 1

Aliminum die

Selection and Manipulation of denture base materials: Three commonly used Denture Base Materials were used for the study. The materials were divided into three groups of 20 samples each, with a total of 60 samples (figure 2).

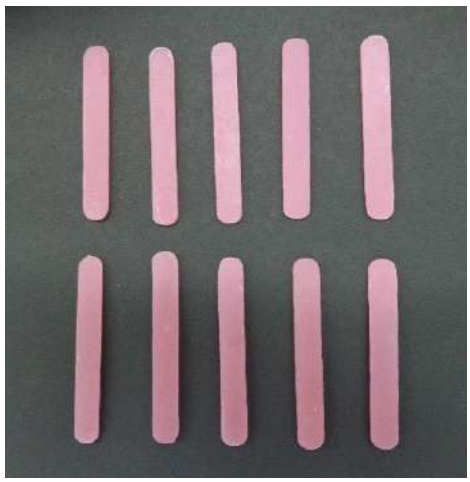

Figure 2

Acrylic Samples:

Group I: PMMA pink heat cure resin (Dental Products of India, Mumbai)

Group II: PMMA pink heat cure resin (SR Triplex Hot, IVOCLAR VIVADENT AG)

Group III: PMMA pink heat cure resin (Trevalon, Dentsply India Private Limited. Gurgaon Haryana)

Preparation of samples:-The heat cure denture base materials were dispensed and mixed following manufacturer's instructions. When the mix reached the dough stage, the die was packed and a cellophane sheet was used as separating medium between the die and the

resin mix. After packing, the die was placed in a Kavo clamp which was subsequently placed in a hydraulic press at 2000 psi for 5 mins. Overnight bench curing was allowed and then the samples were placed in an acrylizer for long curing, bench cooled overnight and samples were removed from the die and finished with 100, 200, 400 and 600grit of sandpaper, followed by polishing with pumice

Storage in water: The samples were divided into six sub groups, three sub groups Ia, IIa, IIIa were used as control. The other three sub groups Ib, IIb, IIIb were weighed and stored in distilled water at 37□C and the specimens were then subjected to flexural testing.

Test for flexural properties: The specimens were tested for ultimate flexural strength (MPa), flexural strength at the proportional limit (MPa) and the elastic modulus (MPa). Height and width of each specimen was recorded before testing. Dry specimens (control group) were tested soon after they were prepared. For water immersed specimens, each specimen was taken out one by one from water storage and placed on a 50 mm-long support for three point flexural testing. A vertical load was then applied at the mid-point of the specimen at a crosshead speed of 5 mm/min on a load testing machine. Load was applied until failure, and fracture load was recorded in Newtons (N) (figure 3).

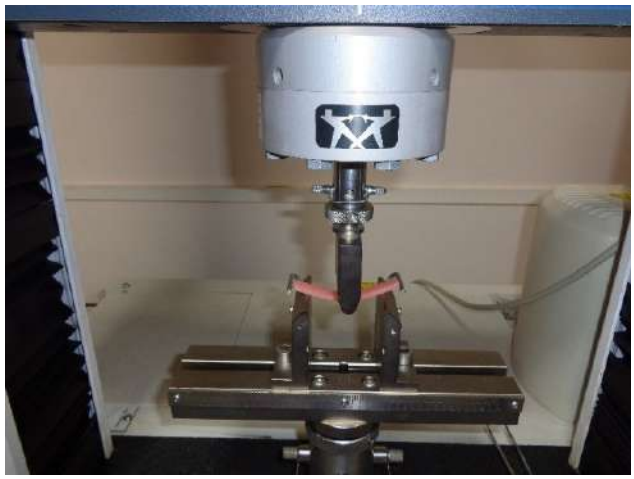

Figure 3

Testing using Instron machine: All the tests were performed under uniform atmospheric conditions of 23.0 ± 1□C and 50 ± 1% relative humidity and calculated using formulas.

Calculation of ultimate flexural strength: UFS = $3FL/2bh^2$

F: Load at fracture, L: Span length that was 50mm, b: Width of the Specimen,h: thickness of the specimen.

Calculation of Flexural Strength at Proportional Limit:-F_{PL} = 3F1L/2bh2

F1: Load at Proportional limit. The load at proportional limit was determined from each load deflection graph that was plotted for every specimen,L: Span length that was 50 mm,b: Width of the specimen, h: Thickness of the specimen.

Calculation of Elastic Modulus: MOE=F2L3/4bh3d

F2: Load at any point on the straight line of the load/ deflection graph,L: Span length 50mm,b: width of the specimen,h: Thickness of the specimen,d: Deflection corresponding to F2.

Statistical Analysis: Data was analyzed using Statistical Package for Social Sciences (SPSS), version 18.0 (SPSS Inc. Chicago IL). Mean (X) and Standard Deviation (SD) was calculated for ultimate flexural strength, flexural strength at proportional limit and modulus of elasticity.

For all the tests a p-value of <0.05 was considered statistically significant. Comparison of mean values was done using ANOVA with post-hoc Tukey's test. Comparison of mean before and after values were done using student t test.

Results

Mean ultimate flexural strength (UFS) for group Ia, Ib; IIa, IIb; IIIa, IIIb were compared using student t test. There were significant differences in the values of ultimate flexural strength among the dry and the wet samples of each group/brands. (Table 1)

Mean flexural strength at proportional limit (F_{PL}) for Ia (dry) (34.89±4.36), Ib (wet) (37.92±5.65), IIa (dry) (32.87±3.58), IIb (wet) (35.16±4.25), IIIa (dry) (37.04±5.48), IIIb (wet) (35.50±6.98) compared with student t test. There was no significant difference in the values of flexural strength at proportional limit among the dry and the wet samples of each group/brands.

Mean modulus of elasticity (MOE) for group Ia, Ib; IIa, IIb; IIIa, IIIb were compared using student t test. There was significant difference in the values of modulus of elasticity among the dry and the wet samples of each group/brands. (Table 2) MOE increased after water immersion.

When compared among the three brands the flexural properties were similar to each other and there was no significant difference.

Table 1: Comparison of ultimate flexural strength (UFS) of dry and wet samples of each group/brands.

UFS	Dry (a)		Wet (b)		p-value
	Mean	SD	Mean	SD	
Group I	93.51	6.55	79.62**	10.17	0.002; Sig
Group II	92.65	5.93	72.92**	8.03	<0.001; Sig
Group III	91.66	8.65	79.88**	8.37	0.008; Sig

Table 2: Comparison of modulus of elasticity (MOE) of dry and wet samples of each group/brands.

MOE (Ŋ)	Dry (a)		Wet (b)		p-value
	Mean	SD	Mean	SD	
Group I	2588.33	195.11	2724.60	194.54*	0.031; Sig
Group II	2472.16	126.52	2738.57	218.19**	<0.001; Sig
Group III	2488.11	123.32	2803.24	170.38**	<0.001; Sig

* ($P < 0.05$) ** ($P < 0.001$)

Discussion

The ultimate flexural strength of a material reflects its potential to resist catastrophic failure under a flexural load. High flexural strength is crucial to denture wearing success, as alveolar resorption is a gradual, irregular process that leaves tissue-borne prostheses unevenly supported. As a foundation, the acrylic resin materials should exhibit a high proportional limit to resist plastic deformation and also exhibit fatigue resistance to endure repeated masticatory loads.[19] The prime and most frequent site of fracture in the upper denture is in the medial line. During chewing, denture base material is subjected to flexural deformation.[20] An acrylic resin capable of sustaining higher flexure in combination with high resistance to cyclic loading may be less prone to clinical failure.[19] In the present study, INSTRON three point bend test was used to calculate the flexural properties, including the measurement of ultimate flexural strength, modulus of elasticity and flexural strength at proportional limit.

The results of this study revealed that, the ultimate flexural strength of three groups/brands of heat cure denture base resins reduced significantly after long term water immersion. These results were similar to the results as shown by previous studies conducted by Vallittu et al in 1998 for 48 weeks[15] of water immersion and in 2000 for 10 years[16] of water immersion.

The second parameter evaluated in this study was the flexural strength at proportional limit (F_{PL}). Denture base plastics typically exhibit considerable plastic deformation before fracture. The plastic deformation beyond its proportional limit permanently alters the dimensions of a denture and is not clinically acceptable. Hence, in this study, the flexural strength at the proportional limit was also evaluated. The proportional limit of each sample was calculated using the load deflection graph. The values of mean flexural strength at proportional limit (F_{PL}) showed that the flexural strength at proportional limit (F_{PL}) did not show any significant difference after water immersion over a period of three months. These results were in accordance with the previous studies done by Takahashi[17, 21] et al in 1999, and in 2013, and Sasaki[14] et al in 2016.

The third parameter used in the study was modulus of elasticity (MOE). As modulus of elasticity increases, the material becomes more rigid. A denture base material with a high elastic modulus can withstand permanent mastication-induced deformation.[22] The present study showed decrease in the modulus of elasticity after long term water immersion for all the groups. These results are consistent with the previous studies conducted by Vallittu[15, 16] et al in 1998 and 2007 and Sasaki[13] et al in the 2016. The results varied from the study conducted by Takahashi et al in 2103 where the Modulus of elasticity increased after water immersion.[21] This variation in

results may be due to difference in control groups. In the present study the controls were dry samples, while in study done by Takahashi[21] et al the control samples were immersed in water.

Thus, the strength of a denture polymer at a given time after water immersion is affected by the relative number of those molecules present[17]. Similarly, in this study, the outward leakage of the soluble constituents affected the flexural properties and it appeared that the ultimate flexural strengths and the elastic modulus decreased. As a result, the denture base resins became weak and less stiff after long term water immersion. From these results, it appears that denture base resins generally trend toward decreasing the elastic modulus after water immersion over a period of three months.

To summarize, water immersion over a period of three months generally decreased the ultimate flexural strength and did not change the flexural strength at the proportional limit, it also increased the elastic modulus of the denture base resins. The decrease in the ultimate flexural strength of denture resins results in weakness, which is not acceptable in material science. However, no change in the flexural strength at the proportional limit of denture resins means keeping the resistance to plastic deformation and an increase in the elastic modulus of denture resins causes stiffness, which are both clinically acceptable.

Conclusion:

Within the limitations of the study, it was concluded that,

1. The flexural properties of all the three denture base resins were affected by water immersion over a period of three months.
2. The ultimate flexural strength decreased after l water immersion over a period of three months.
3. However the flexural strength at proportional limit remains the same after water immersion over a period of three months.
4. The modulus of elasticity decreased after water immersion over a period of three months.
5. When compared among the three brands the flexural properties were similar to each other and there was no significant difference.

Ethical Clearance: Taken from Institutional ethical committee, Manipal.

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Effect of Weight Bearing and Neurobic Exercises on Bone Health and Physical Function in Elderly Individuals

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Abstract

Aim: To study the effect of weight-bearing and neurobic exercises on bone health and physical function in elderly individuals.

Objectives: The Objectives of the study are as follows: [1] To find out the effect of weight bearing on bone health and physical function in elderly individuals. [2] To find out the effect of weight bearing and neurobic exercises in combination on bone health and physical function in elderly individuals.

Method: Ethical clearance was obtained from Institutional Ethical Committee. 80 elderly individuals were assessed and 62 were included in the study based on inclusion criteria, the individuals were allocated into two groups: Group A (n= 31) received Weight-bearing exercises and Group B (n= 31) received Weight-bearing and Neurobic exercises in combination. Pre and post-test were done for fasting serum calcium, alkaline phosphatase and SF 36 Health related quality of life questionnaire physical function component and the outcome measures were analysed after 6 weeks.

Result: Intergroup statistical analysis for serum calcium ($p<0.0001$), Alkaline phosphatase ($p<0.0001$) and SF 36 physical function component ($p<0.0001$) revealed extremely significant difference post intervention. Analysis of serum calcium, alkaline phosphatase and SF 36 score for group A ($p<0.0001$) and for group B ($p<0.0001$) was extremely significant respectively.

Conclusion: The study results concluded that Weight bearing and Neurobic exercises was significantly effective in improved bone health and physical function both individually and in combination.

Keywords: *Weight bearing, Neurobic, Exercises, Bone health, Physical function, Elderly individuals.*

Introduction

Geriatrics is the branch of medicine dealing with the physiologic characteristics of aging and the diagnosis and treatment of diseases affecting the aged.[1] Elderly people show variations in age related physiological decline and gives rise to disorders. Age related decline in bone metabolism, reabsorption, nutrition, muscle strength, memory, mobility and locomotion. [2] Elderly individuals with nutritional deficiency of calcium, vitamin D and poor mobility experiences decline in normal functioning which gives rise to osteoporosis and imbalance in bone biomarkers such as serum calcium and alkaline phosphatase.[3] Osteoporosis is a systemic, skeletal disease characterised by low bone density and micro-architectural deterioration of tissue with consequent increase in bone fragility. It is more common in postmenopausal women due to cessation of oestrogen secretion. There may be a risk in males also due to calcium and vitamin deficiency of vitamin D, sedentary lifestyle, smoking, alcoholism and excess caffeine. [4] The prevalence of osteoporosis in India (Delhi) as 24.6% in men and 42.5% in women above 50 years of age.[5] There is a positive correlation for prevalence in low calcium levels and hampered reabsorption and bone metabolism. Assessment of specific alkaline phosphatase

has an important role in prevention and treatment bone related disorders Bone biochemical markers can provide practical detection of the exercise response on bone cells. Serum bone alkaline phosphatase (B-ALP) and serum calcium used to indicate bone synthesis. The major regulator of bone metabolism is Parathyroid hormone (PTH) to maintain the calcium-ion concentration, which is a primary determinant of intracellular calcium homeostasis. The stimulation of bone formation and reabsorption can be initiated by weight bearing exercises. The use of biomarkers to determine the mechanism of impact of exercises on bone health. [6,7] On the other hand there is a gradual decline of cognitive function with aging which causes difficulty in conducting activities of daily living and worsens the quality of life, hence SF 36 physical HRQOL questionnaire to assess the quality of life and improve it by exercises for both the domains like physical function and bone health.[8]

Weight bearing exercises are mechanical loading exercises on joints, which are essential for building and maintaining healthy bones, and they include activities recruiting muscle work and stimulate bone metabolism against gravity. During weight bearing, exercise bones adopt to the impact of weight and pull of muscles help building newer bone cells. In addition, it improves strength, joint mobility and reduces risk of fractures as well as osteopenia and osteoporosis. [9]

A unique brain exercise program known as neurobic exercises are based on the latest findings of scientific research, which include the combinations of physical senses such as hearing, vision and memory. Neurobic exercises stimulate neural activity to strengthen and grow brain cells continuously, which activates neural systems to work and increases blood supply to the brain. The cortex and hippocampus are involved during such activities, located at medial temporal lobe. In addition, Neurobic exercise stimulates pattern of neural activity, which in turn improves cognitive function and helps in better physical function. In this study the use of simultaneous performance of multiple tasks is done which will concurrently challenge the motor and cognitive function.[10] These exercises are dual task technique to explore multi-tasking and effect of this training on physical function. [11] Combination of weight-bearing and neurobic exercises may demonstrate positive effects on physical function in aging.

There are literatures which prove both physical and cognitive training have potentials to improve quality of life in elderly individuals. The exercises will amplify the efficacy of both bone health and physical function.

Method

- Study type: Experimental study
- Study design: Pre-test Post-test
- Study duration: 1 year
- Sample size: 31+31 = 62
- Place of study: Krishna Hospital, Karad

Criterion of the Study:

Inclusion Criteria:

- Elderly individuals of age group 60 to 80 years.
- Both men and women are involved.
- Elderly individuals diagnosed with low serum calcium less than 8.5 mg/dL.

Exclusion Criteria:

- Elderly individuals with significant visual or hearing impairment.
- Elderly individuals with neurological disorders.
- Elderly individuals with recent surgeries.

Procedure: An approval for the study was obtained from the Protocol committee and institutional Ethical Committee of KIMSDU. Awareness program was carried out for elderly individuals in karad and surrounding rural areas near Krishna hospital.

Geriatric subjects were screened and those fulfilling the criteria were involved. Participants were informed about the study, thorough information was given, and importance for testing serum calcium and alkaline phosphatase was explained.

Informed Consent was taken from the subjects. Pre-test assessment was taken by using blood investigations of serum calcium and alkaline phosphatase with permission and help of staff from biochemistry department and nursing staff and questionnaire SF 36 health related quality of life, physical function component was taken and data collection sheets were collected.

Subjects involved in the study were divided into two groups. The sampling method was consecutive sampling. Exercise protocol was started.

Group A: Subjects were given used weight-bearing exercises.

Group B: Subjects were given weight bearing and neurobic exercises in combination.

After completing 6 weeks with 3 sessions per week, post-test assessment was taken by using blood investigation of serum calcium, alkaline phosphatase and questionnaire SF 36 health related quality of life, physical component to assess the patient.

The interpretation of the study was done on the basis of comparing pre-test and post-test assessment using outcome measures and were statistically analysed.

Following exercises were given for Group A and B:

Sr. No.	Weight-bearing exercises (Group A)	Weight bearing and neurobic exercises (Group B)
1.	Mini squats 30 x 3 sets	Mini squat and table of 10 aloud as instructed by therapist 30x3
2.	Quadruped transition and leg raises and hand raises 30 x 3 sets	Lunge walking with half kg dumbbells and count backward from 100 30x3 sets
3.	Lunges with alternate legs 30x 3 sets	Transitions in quadruped with reach outs and read the colour of the print shown 30x 3 sets
4.	Standing leg curls with support 30 x 3 sets	Squats and pick up the colour of ball from the basket as instructed by therapist 30x 3 sets
5.	Wide leg squats with sit to stand 30 x 3 sets	Wide leg squats with Swiss ball in the hand 30x3 sets
6.	Seated rowing with half kg dumbbells 30x 3 sets	Standing leg curls with chart on the wall and point out the instructed numbers 30 x 3 sets
7.	Step ups 30 x 3 sets	Alternate step up with random number generation 30x 3 sets

Results

Table No. 1: Comparison of pre and post serum calcium, alkaline phosphatase and SF 36 score within the group

	Mean±SD	P value	T value	df
Group A Pre Serum Calcium	7.643±0.4248	<0.0001	17.727	29
Group A Post Serum Calcium	8.686±0.3411			
Group A pre alkaline Phosphatase	108±16.509	<0.0001	14.088	29
Group A post alkaline phosphatase	150.1±3.986			
Group A pre SF 36 score	54.8±4.979	<0.0001	8.960	29
Group A post SF 36 score	69.033±7.384			

Table No. 2: Comparison of pre and post serum calcium, alkaline phosphatase and SF 36 score within the group

	Mean±SD	P value	T value	df
Group B Pre Serum Calcium	7.39±0.4788	<0.0001	13.524	29
Group B Post Serum Calcium	8.71±0.1788			
Group B pre alkaline Phosphatase	107±17.486	<0.0001	11.032	29
Group B post alkaline phosphatase	140.73±11.298			
Group B pre SF 36 score	58.9±5.851	<0.0001	18.058	29
Group B post SF 36 score	76.566			

Table No. 3: Comparison of pre pre serum calcium, alkaline phosphatase and SF 36 score between the groups

		Mean±SD	P value	T value	df
Serum Calcium	Pre	7.40±0.4266	0.8873	0.1424	58
	Pre	7.39±0.4788			
Alkaline Phosphatase	Pre	108±16.509	0.8798	0.1518	58
	Pre	107±17.486			
SF 36 Score	Pre	54.8±4.979	0.6340	0.4786	58
	Pre	55.366±4.156			

Table No. 4: Comparison of pre pre serum calcium, alkaline phosphatase and SF 36 score between the groups

		Mean±SD	P value	T value	df
Serum Calcium	Post	8.686±0.3411	0.0012	0.3318	58
	Post	8.71±0.1788			
Alkaline Phosphatase	Post	140.733±11.298	<0.0001	4.282	58
	Post	150.1±3.986			
SF 36 Score	Post	69.033±7.384	<0.0001	4.433	58
	Post	76.566±5.667			

Discussion

In Geriatric age, the ability to carry out multiple tasks or common activities of daily living is diminished and they remain physically inactive, as many activities requires simultaneous performance of dual tasks. There are literatures frequently adopting the dual task techniques and find the effect on ability to perform physical function, but there is limited pool of knowledge in neurobic exercises involving cognitive function that is expected in concomitant performance of different tasks, stability and balance deteriorates with lack of attention and cognitive deficit. The second most important part of the study is prevention of fall. As physical activity is reduced gradual deconditioning occurs which increases the risk of fall. Around 28-35% above age of 65 years fall at least once a year. The present study "effect of weight-bearing and neurobic exercises on bone health and physical function in elderly individuals" was conducted to improve health related quality of life and prevention of declining bone health among elderly.

The objectives of the study were 1. To find the effect of weight-bearing exercises on bone health and physical function in elderly. 2. To find out the effect of weight-bearing exercises in combination with neurobic exercises on bone health and physical function. The study was conducted with 62 subjects. Subjects were divided into two groups. Group A (Weight-bearing exercises) group B (weight-bearing and neurobic exercises). Prior consent was taken. The treatment protocol was carried out for 3 days per week for 6 weeks. The outcome measures for this study were serum calcium levels, alkaline phosphatase and SF 36 health related quality of life questionnaire physical function component. The results of the study showed that there was significant difference in improving physical function component, serum calcium levels and alkaline phosphatase after 6 weeks of intervention in both the groups. Group A (weight-bearing exercises) group B (weight-bearing and neurobic exercises) which was statistically analysed. Paired 't' test was used to analyse the results within the groups (group A pre and post-test and group B pre and post-test) and showed that there was extremely significant improvement in serum calcium (*$p<0.0001$) alkaline phosphatase ($p<0.0001$) SF 36 health related quality of life questionnaire (*$p<0.0001$).

A study done by Cavanagh et. al. in 2005 showed that lack of load-bearing and physical inactivity leads to destructive blood loss, while bone formation increase when immobilised subjects start physical activity. This concludes that physical activity enhances bone formation and stimulates PTH which increases bone metabolism which in turn increases bone biomarkers such as alkaline

phosphatase and serum calcium, thus improves quality of life.[12] A study done by Nirupama Singh et, al. shows that neurobic exercises aim to maintain mental fitness and intact cognitive functions which is responsible for planning initiating and monitoring complex activities, there indispensable for independent ADL and better QoL.[13]

Comparison of serum calcium, alkaline phosphatase and SF 36 health related quality of life physical component score between two groups was done by using unpaired t test to find out the effects in two groups. The statistical analysis revealed that there was extremely significant difference found in serum calcium level in both the groups post-test (*p<0.0001). The statistical analysis revealed that there was extremely significant difference found in alkaline phosphatase (*p<0.0001) in both the groups post-test. The statistical analysis revealed that there was extremely significant difference found in SF 36 health related quality of life questionnaire score in both the groups post-test. Thus this showed that there was improvement in bone health and SF 36 HRQoL questionnaire physical function component in elderly individuals. Primary focus of the study was to improve physical component of health related quality of life and to see the effect of intervention on bone biochemical markers in elderly individuals while performing dual task neurobic exercises improves cognitive function and executes marked improvement in physical function component.

For independent ADLs or better physical functions like vigorous activity. moderate activity, lifting groceries, climbing several flights, climbing one flight of stair, bathing and dressing etc it is necessary to have better bone health. As for example, a person with osteoporosis may not be able to do his physical activities due to lack of bone health causing pain or frequent fractures. Moreover, elderly population have mild cognitive impairment due to aging.

Thus, this study is designed to provide a recreational treatment were involving subjects in interesting neurobic activities to keep the subject's compliance and treating them with weight bearing exercises.

Therefore, the result of the present study showed that intervention was effective in both groups. Group B which consisted weight-bearing and neurobic exercises which showed marked effective results and were helpful in improving bone health and physical component of HRQoL while Group A consisted weight-bearing exercises.

Conclusion

Based on the statistical presentation, analysis and interpretation it can be concluded that the weight-bearing and neurobic exercises has shown significant improvement in serum calcium, alkaline phosphatase and Sf 36 score.

Thus, the present study provided the evidence to support that weight bearing and neurobic exercises has shown improvement in the blood biochemical markers and physical function in elderly individuals.

However, the subjects treated with weight bearing and neurobic exercises in combination showed significant improvement rather than only weight-bearing exercises alone.

Conflict of Interest: The author declares that there are no conflicts of interest concerning the content of the present study.

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Ethical Clearance: The study was approved by Institutional Ethics Committee, KIMSDU.

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Knowledge, Attitude and Practice of Biomedical Waste Management in Nursing Staff of a Private and a Government Tertiary Care Teaching Hospital: A Comparative Study

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Abstract

Introduction: Biomedical waste is "Any waste which is generated in the diagnosis, treatment or immunization of human beings or animals or during research" in a hospital. Improper disposal of hospital waste poses a major threat to the environment. Lack of proper management, awareness, insufficient resources and poor control of disposal of waste are the most pressing problems faced .

Objective: To compare the knowledge, attitude and practice of hospital waste management in nursing staffs and nursing assistants of a private and government tertiary care hospital in Chennai, Tamil Nadu.

Methodology: This is a cross sectional study done in a private and a government tertiary care teaching institute on 300 nursing staff (150 from each) using an orally administered structured questionnaire. The data were entered into excel and analysis was done.

Result: Of the 150 participants from government hospital 71% had training in BMW management, 82% knew where to report in case of a needle stick injury, 61% perceived that they have adequate knowledge regarding BMW management, 98% were willing to attend programmes regarding BMW. 73% had good knowledge regarding BMW management. 90% practice good management of BMW.

Of the 150 participants from private hospital 81%had training in BMW management, 79% knew where to report in case of needle stick injury, 67% perceived that they have adequate knowledge regarding BMW management, 95% were willing to attend programs regarding BMW management. 74% had good knowledge. 85% practice good management of BMW.

Conclusion: The knowledge, attitude and practice of BMW management among nurses and nursing assistants of the private and the government hospital are found to be satisfactory. There is no significant difference (at $p<0.05$) in the knowledge, attitude and practice of BMW management among the nurses and nursing assistants of both the hospitals.

Keywords: *Biomedical waste management, knowledge, attitude, practice, nursing staff.*

Introduction

Biomedical waste(BMW) is the waste that is generated in hospitals and health care centres during diagnosis, treatment or immunisation of human beings, mainly consists of needles, syringes, ampoules, dressing materials, disposable plastics and microbiological wastes[(1)]. With the aim of reducing health problems and treating the sick, health care services inevitably produce wastes that may be hazardous to health. According to the World Health Organisation (WHO), 10-25% of the biomedical waste are estimated to be hazardous[(2)]. Improper handling of biomedical waste increases the airborne pathogenic microbes, adversely affecting the

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hospital environment and community at large. Apart from polluting water, air & soil, it also has considerable impact on human health due to aesthetic effects.

BMW management (BMWM) means the management of waste produced by hospitals using techniques that will check the spread of diseases. The objectives of biomedical waste management are toreduce waste generation, to ensure its efficient collection, handling, as well as safe disposal in such a way that it controls infection as these wastes need a special attention for their proper disposal. Adequate knowledge, attitude and practices regarding biomedical waste management is lacking in developing countries[3]. The volume of the health care wastes have also increased over the last 30 years. The World Health Organisation has hence prepared biomedical waste management guidelines to ensure proper handling of these wastes.

This study was done to assess and compare the knowledge, attitude and practice of biomedical waste management among the nursing staff working in a private tertiary care hospital and a government tertiary care hospital in Chennai.

Materials and Method

This was an observational cross-sectional study done from January 2019 to May 2019. This study was conducted in a private tertiary care hospital and in a government tertiary care hospital situated in Chennai, capital city of Tamil Nadu in South India. The study included the nurses and nursing assistants working in the above mentioned institutions.

The sample size of the study is n=300, 150 from each of the above mentioned institutions. The sample size was measured using the formula {(Za-Z1-b)^2*[P1(100-P1)+P2(100-P2)]}/(P1-P2)^2, where P1 = 35%, P2=20%[4], expected difference of 15%, alpha error of 5% at 95% confidence interval.

After obtaining permission from the human resource department, a list of all the nurses and nursing assistants working in the above mentioned institutions was obtained and the participants were selected randomly using random numbers table. Nurses and nursing assistants not willing to participate in the study were excluded.

The study tool used was an orally administered structured questionnaire containing questions regarding the knowledge, attitude and practice of Biomedical waste management (BMWM) respectively. Questions related to demographic details like the participants name, age, sex,department they are currently working in, total years of experience, years worked in the current hospital,their training in biomedical waste management, years of experience, vaccination against Hepatitis, needle stick injury were also included. It included eleven questions to assess their knowledge, which included questions regarding where they would dispose certain wastes like anatomical wastes, contaminated gauze, disposable intravenous tubes and catheters, broken glass vials, discarded disinfectants, contaminated mattresses and linens . The six attitude questions were regarding whether they thought biomedical waste management as a financial burden on the setup, do they find it as a burden to report a needle stick injury, whether they are interested in attending programs to enhance and upgrade their knowledge on biomedical waste management and if they think it is important to dispose health care wastes in a proper manner. Six questions regarding their practice of biomedical waste management was also included (Table 2). One point was awarded to each correct answer and the wrong answers weren't given any point. Each of the three aspects were assessed separately and a score of more than 60% was considered that the participant had good knowledge, attitude and practice of biomedical waste management. The data was entered in MS- Excel spreadsheet and analysis was done using SPSS software. Qualitative data was expressed as frequencies and proportions, quantitative data were summarised as mean (standard deviation). Bivariate analysis was done using chi square.

Results

A total of 300 nurses and nursing assistants took part in this study, of which 150 were from the private institute and 150 were from the government institute.

The mean age of the participants from the government institute was 32.9 years whereas the that of participants from the private institute was 25.17 years. Of the participants,81% from the government institute and 75% from the private institute were nurses. The mean years of experience was higher in the government, which is 8.29 years compared to 3.06 mean years in the private institute (Table 1).

Significantly more percent of the participants (90%) from the government institute separate biomedical waste during collection and they also collect liquid

waste in leakage proof bags (77%) when compared to the participants from the private institute. Significantly more participants from the private institute collect liquid and other wastes together (43%) whereas more percent (23%) of participants from the government institute store infectious waste together with the other wastes. 83% of the participants from the government institute use personal protection while handling biomedical waste whereas only 77% of the participants from the private institute do so which is significantly less when compared.(Table 2)

Only 71% of the participants from the government institute and 81% of the participants from the private institute have had training in biomedical waste management.(figure 1).

Although the difference is not statistically significant, it was found out that increased percentage of the participants from the government institute had a good knowledge, attitude regarding biomedical waste management and a good practice of biomedical waste management when compared with the participants from the private institute (Table 3).

All the participants from the private institute had been vaccinated against Hepatitis B compared to the 73% from the government institute and 82% of the government institute participants knew to whom they were supposed to report an incident of needle stick injury compared to the 79% from the private institute. 25% of the participants from the private institute have had a needle stick injury in the past and 90% of them had reported the incident to appropriate authority, whereas 33% of the participants from the government institute have had a needle stick injury and all of them had reported the incident to the authority.

61% of the participants from the government institute showed a positive attitude towards biomedical waste management but only 48% of the private institute participants showed positive attitude. 98% of the participants from the government institute and 95% of the participants from the private institute were willing to attend programs regarding biomedical waste management.

70% of the participants from the private institute and 62% of the participants from the government institute think that there is an increased risk of injury if the health care waste is segregated at the source. 45% of the participants from the private institute and 33% of the participants from the government institute think BMWM setup as a financial burden on the institute. 31% of the total study population consider it as a burden to report needle stick injury .

Table 1: General profile of the participants

General Profile	Government	Private
Mean age	32.89 years	25.17 years
Mean years of experience	8.29 years	3.06 years
Nurses	122 (81%)	112(75%)
Nursing assistants	28 (19%)	38 (25%)

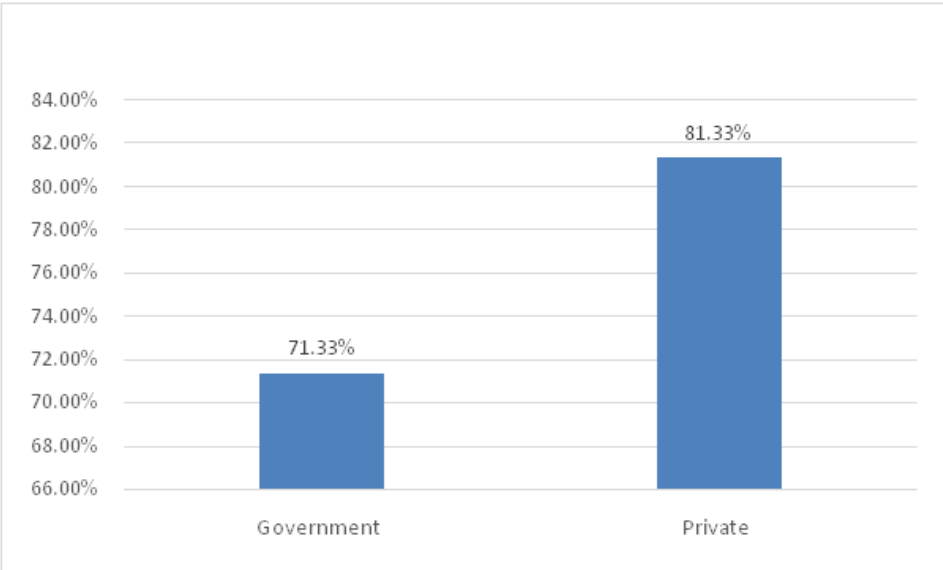

Figure 1: Participants with training in BMWM.

Table 2: Comparison between the various practice habits of the participants from the two institutes

Practice Habits	Government	Private	P- Value
Sort BMW during collection	135 (90%)	120 (80%)	0.015293 *
Separate sharps from blunt waste	140 (93%)	137 (91%)	0.515049
Use personal protection tools while handling BMW	125(83%)	116 (77%)	0.191118
Collect liquid waste in leakage proof bags	115 (77%)	91(61%)	0.002815*
Collect liquid and other wastes together	44 (29%)	64 (43%)	0.016145*
Store infectious wastes together with other wastes	35 (23%)	14 (9%)	0.001039*

* Significant at $P < 0.05$

Table 3 Comparison between the percentage of participants having good knowledge, practicing good management of BMW and having a good attitude regarding the same

	Government	Private	P- Value
Good knowledge	73.33%	74%	0.872707
Good attitude	61.33%	48.33%	0.076136
Good practice	90%	85.33%	0.285049

Discussion

This is a cross sectional study conducted in a private and a government tertiary care hospitals regarding the knowledge, attitude and practice of BMW among their nurses and nursing assistants.

In this study it was found that 71% of the participants from the government institute and 81% of the participants from the private institute had training in biomedical waste management, compared to 68% of the nurses who participated in a study done by Lohani N et al[5].

All the participants from the private institute had been vaccinated against Hepatitis B compared to the seventy three percent (73%) from the government institute. Only 20% of the nurses who participated in the study done by Soyam GC et al[6] had been vaccinated against Hepatitis. Reporting of an incident of needle stick injury was high in both the study groups (100% in the government and 90% in the private institutions) when compared to a study done by Stein et al[7] which showed only 37% reporting .

83% of the participants from the government institute use personal protection while handling biomedical waste whereas only 77% of the participants from the private institute do so. In a study by Madhu Kumar et al[8] all the participants wore personal protective equipments while handling biomedical waste.

98% of the study population knew about the different biomedical waste categories compared to 56% of the participants in a study done by Basu et al[9], 45% of nurses of a study by Anand P et al[10]and 90% of the study population consisting of doctors and nursesin a study conducted by Mathur et al[11].

Sixty one percent (61%) of the participants from the government institute and only forty eight percent (48%) of the private institute participants showed a positive attitude towards biomedical waste management. In a study done by Adekunle Olalfa et al[12], 54% of the staff who participated showed a positive attitude towards biomedical waste management.

70% of the participants from the private institute and 62% of the participants from the government institute think that there is an increased risk of injury if the health care waste is segregated at the source, whereas in a study by Adekunle Olalfa[12]et al 24% of the participants had the same idea. 31% of the participants consider it as a burden to report needle stick injury, while 44% of the nurses who participated in a study by Anand P et al[10] thought the same. But in a study by Malini et al[13], the participants did not consider it as a burden to report an incident of needle stick injury. 45% of the participants from the private institute and 33% of the participants from the government institute think biomedical waste management setup as a financial burden on the institute. In a study done by Khan MJ et al[14],53% of the physicians who took part thought BMWM setup as a financial burden on the institute.

Conclusion

In this study it has been found that the difference in the knowledge, attitude and practice of biomedical waste management was not significant. But certain aspects in the practice of biomedical waste management like segregation of waste during collection and collection

of liquid and other wastes separately were better among the participants from the government institute, whereas more percent of participants from the private institute stored infective and other wastes separately. The attitude regarding biomedical waste management was better in the participants from the government institute than that of the participants from the private institute and more participants from the government institute were willing to attend programs to improve their knowledge and practice of biomedical waste management .

Even though the knowledge, attitude and practice of biomedical waste management are not poor among the participants of this study, it can be further improved by conducting programs stressing not only on the knowledge and practice but also should stress about the attitude of the workers towards biomedical waste management by educating them about the importance of it and by enlightening them about the hazardous effects of improper management of biomedical waste management on the environment, public health and also on health of the health care workers themselves.

Conflict of Interest: Nil

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WTO and its Impact on Indian Pharmaceutical Production: A Legal Perspective

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Abstract

Pharmaceutical Company and Pharmaceutical production plays a significant role in the economic development of a country. It is even more important for developing country like India which needs to generate employment, achieve higher rate of growth, poverty elevation programs, improve the standard of living of its people and stabilize the price level of healthcare. Role of World Trade Organisation (WTO) is very important for regulation. The WTO was established in 1995 and when compared with the GATT is much wider in scope, with a stronger institutional basis and with treaty status. The main aim of this paper is to analyze the Indian pharmaceutical production performance, pre and post implementation of WTO policies. It is clear that the implementation of WTO policies, Compound Annual Growth Rate (CAGR) of India's pharmaceutical production has minute effect on it. The topic is of essence as in based on doctrinal study where by different set of data has been gathered from the primary and secondary sources. The research Article is an outcome of research which the research scholar is under taking in pursuance and for conferment of Ph.d Degree.

Keywords: *GATT, WTO, Pharmaceutical production, Compound Annual Growth Rate, Economic Development.*

Introduction

Pharmaceutical industry has long being regarded as one of the most important areas blocking the way to the strengthening of a liberal trade system. The Indian pharmaceutical industry, now a USD 20 billion (over Rs 90,000 crore) Industry, has shown tremendous progress in terms of infrastructure development, technology base creation and a wide range of products. It has established its presence and determination to flourish in the changing environment. The industry now produces bulk drugs belonging to all major therapeutic groups requiring complicated manufacturing technologies. Formulations in various dosage forms are being produced in Good Manufacturing Practice (GMP) compliant facilities. Strong scientific and technical manpower and pioneering work done in process development have made these possible.[8] The country now ranks 4th worldwide accounting for 8% of world's production by volume and 1.5% by value. It ranks 17th in terms of export value of bulk actives and dosage forms. Indian exports are destined to more than 200 countries around the globe including highly regulated markets of US, Europe, Japan and Australia. Indian Pharmaceutical Industry has made phenomenal progress over the years and made its impact in the global market. Indian Pharmaceutical industry has been recognized as reliable source for drugs and drug intermediates, pharmaceutical formulations. Tremendous opportunities are available for Indian Pharma industry in post 2005 era to manufacture and export many products getting off-patented. Its immense strength in manufacturing quality medicines at affordable prices made the Indian Pharma industry to compete both in regulated and non-regulated markets. Apart from its strengths in manufacturing and exporting allopathic medicines, India is known for its own systems of medicines with about 7000 units manufacturing various Indian system of medicines viz., Ayurveda, Unani, Siddha, Homeopathy etc. Though strong in cultivation/manufacture of Indian system of medicines, India's share in the global herbal market, estimated at US$ 63 billion, is less than 0.2%, which shows that there

is a tremendous scope for export market. Fast growing Biotech industry estimated at about US$ 2 billion market, is a another part of Indian Pharma industry in India, which has great potential in the international market and which needs focused attention to improve its performance in the international market. While its generics market is growing strong, it is also evolving into a cradle for new drug. As one of the strongest emerging market in the global pharma industry, India presents great opportunities for all international pharmaceuticals companies to explore and benefit from.

WTO and TRIPS Agreement: The World Trade Organization's Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) set global minimum standards for the protection of intellectual property. The TRIPs Agreement deals not only with patents but also with other forms of intellectual property rights such as copyright, trademark, industrial designs, geographical indications, and confidential information.[9] The TRIPS Agreement forced not only product patents for pharmaceuticals to be introduced but also twenty-year periods of patent protection at the leastto be ensured. WTO members must comply with the obligations of the TRIPS Agreement. TRIPS compliance was postponed until 2005 for developing countries. Until the deadline for TRIPS compliance, India undertook three amendments in March 1999, June 2002, and March 2005. InMarch 2005, India completed the amendment of the Patent Act of 1970 to comply with the TRIPS Agreement.

The new patent act came into force on 4 April, 2005. It introduced product patents for drugs,foods, and chemical products and the patent term was increased to twenty years. The Indian patent regime has become fully TRIPS compliant. The amendment of the Act changed the institutional factors that had supported the growth of the Indian pharmaceutical industry.

Under the TRIPS agreement, all WTO members have to make patents available for pharmaceutical inventions in their countries. A company that has invented a new pharmaceutical product or process is able to apply for a 20 year patent protection in any WTO member country.

Agreement on Trade Related Investment Measures (TRIMs): The Indian Industry can become more competitive due to inflow of Foreign Direct Investment(FDI) in the fields of Research & Development (R & D) and technology. Governments often impose conditions on foreign investment in order to direct flow of investment in accordance with certain national priorities. Conditions that can affect investment flows are known as Trade Related Investment Measures[10]. There are 24 such TRIMs those countries all over the world use. WTO prohibits use of the following five measures under TRIMS:

- Local Content Requirements (ICRs) imposing use of certain amount of local inputs in production.
- Trade Balancing Requirements: Limiting use of import content in proportion to the export of investing company.
- Trade Balancing Requirements: restricting imports to an amount or value of the producer exported.
- Exchange Restrictions: restrictions on access to foreign exchange to an amount of foreign exchange earnings attributable to the enterprise.
- Domestic sales requirements: requiring a company to sell certain proportion of its production locality.

Once restrictions are removed, MNCs whichare permitted to set up wholly owned subsidiaries as 100% export oriented units, could also start catering to the domestic market and this seriously affect the share of indigenous units.[11]

Indian Position:

The Pharma Industry Prior to Patents Regime: At the time of independence in year 1947 the total drug production in the country was around Rs. 10 crores. At that time the MNCs taking the help of the colonial Patent and Designs Act, 1911 exploited the drug market of our country. They were engaged mainly in the import of drugs from their country of origin. Between 1947-57 99% of the 1704 drugs and pharmaceutical patents in India were held by foreign MNCs. During that time the MNCs who were controlling 80% of the market did not come forward with financial investment and technological help to establish drug production centers in India. Drug prices in India were amongst the highest in the world in 1954[12]. The first public sector drug company Hindustan Antibiotic Ltd.(HAL) was established with the help of WHO and UNICEF. The Indian Drugs and Pharmaceutical Limited (IDPL) were established in 1961 with the help from the Soviet Union. The establishment of these two public sector units and the coming into force of the Drug Policy of 1978 had been mainly responsible for the availability of drugs and medicines at relatively lower prices in India. The

country became almost self-sufficient in the production of drugs.

It is also a fact that after Independence, the Indian government appointed two committees namely Tek Chand Patents Enquiry Committee (1948-50) and Ayyangar Committee (1959) in order to improve accessibility and afford ability of essential drugs in India. These committees recommended amending the Designs and Patents Act of 1911, which recognised product patents for pharmaceuticals. The Designs and Patents Act of 1911 was replaced by the Patent Act of 1970. The Patent Act of 1970 recognised only process patents, and reduced the patent period from sixteen years to seven years. Automatic licenses of right could be issued three years after granting of the patent. The Act allowed Indian pharmaceutical companies to produce alternative processes for drugs that were not patented in India. During the period from the 1970s to the 1980s, Indian companies began to take up R & D work on their own. The weak intellectual property protection regime as envisaged in the Patent Act of 1970 was a turning point in the development of indigenous pharmaceutical R & D. The Act encouraged reverse engineering and the development of alternative processes for products patented in other countries.[13]

The Drug Policy of 1978 was the first comprehensive drug policy enacted in India. The basic framework of the Policy remained largely valid even up until the 1990s. The basic objective of thePolicy was to achieve self-sufficiency in the production of drugs. The Policy emphasised the role of R & D and technology, and enhanced the technological capabilities of the Indian pharmaceutical industry by providing R & D promotion measures. Several measures to guide and control foreign companies with a 75 percent share of the domestic market were implemented so as to be consistent with the basic objective of the Drug Policy of 1978 and promote the production of bulk drugs and intermediates.[14]

The Patent Act of 1970 and the Drug Policy of 1978 paved the way for the progress of indigenous R & D. The ability to develop generic drugs was acquired and improved during the mid-1970s to 1990s. Besides, other industrial policy measures such as the Foreign Exchange Regulation Act of 1974 (FERA) and the Drug Price Control Order of 1970 (DPCO 1970), which were disincentives to foreign companies, also played important roles in the development of the industry.

Case Analysis: Towards the aforesaid deliberation, it is imperative to study some few selected cases concerning pharmaceutical sector involving India as complainant and also as respondent in others before WTO Dispute settlement board. For this purpose, five cases have been indentified where it is found that in three cases India has been the complainant while in two others as respondent. Accordingly the analysis dealt on sere tom basis year wise in manner as under.[15]

(a) Certain Pharmaceutical Products[16] Dispute Settlement (D.S No. 168): In this case India against South Africa. Subject matter of the case is "Anti-Dumping Duties on certain Pharmaceutical Products from India." And the measures at issue include the initiation of the investigation, the conduct of the investigation, and the final determination.

On 1 April 1999, India requested consultations with South Africa in respect of a recommendation for the imposition of definitive anti-dumping duties by the South African Board on Tariffs and Trade (BTT), The BTT allegedly made a preliminary determination on 26 March 1997 that ampicillin and amoxycillin of 250mg and 500mg capsules, exported by M/S Ranbaxy Laboratories Ltd of India, were being dumped into the South African Customs Union (SACU). This was allegedly followed by a recommendation to impose final duties on these products by the BTT, which was reported on 10 September 1997. India contended that:

- the definition and calculation by the BTT of normal value is inconsistent with South Africa's WTO obligations, because erroneous methodology was used for determining the normal value and the resulting margin of dumping;
- the determination of injury was not based on positive evidence and did not include an evaluation of all relevant economic factors and indices having a bearing on the state of the industry, which led to an erroneous determination of material injury suffered by the petitioner.
- the South African authorities' establishment of the facts was not proper and that their evaluation was not unbiased or objectives; and
- the South African authorities have not taken into account India's special situation as a developing country.

India alleged violations of Articles 2, 3, 6(a) to (c)

individually and in conjunction with 12, 12 and 15 of the Anti-Dumping Agreement; and Articles I and VI of GATT 1994.

(b) Import of Pharmaceutical Products: (D.S No.233): In this case India against Argentina. The Subject matter of the case is "Measures affecting the importation of Pharmaceutical products." And the measures at issue include the initiation of the investigation, the conduct of the investigation, and the final determination.

According to India, the above measures require that before entering the Argentinean market, all drugs and other pharmaceuticals must be registered with the National Administration of Drugs, Foodstuffs and Medical Technology, Ministry of Health of Argentina. The above Decree contains two annexes listing countries.

- In respect of Annex I countries, pharmaceutical products are required to be manufactured in facilities approved by the relevant governmental bodies of these countries or by the Argentinean Ministry of Health and meet the National Health Authority's manufacturing and quality control requirements.
- In respect of Annex II countries, manufacturing facilities are required to be inspected and approved by the Ministry of Health of Argentina before export of these pharmaceutical products into Argentina.

India says, it does not figure in either of those two annexes. This alleged discrimination would have led to total lack of market access for Indian drugs and pharmaceutical products in Argentina. India considered that infringement of the following provisions have taken place: Articles 2 (especially 2.2), 5 (especially 5.1 and 5.2) and 12 of the TBT Agreement; Articles I and III of the GATT 1994; and Article XVI: 4 of the Agreement establishing the WTO.

(c) Seizure of Generic Drugs: (D.S No.408): In this case India against European Union and Netherland. The Subject matter of the case is "Seizure of Generic Drugs in Transit." And the measures at issue include the initiation of the investigation, the conduct of the investigation, and the final determination.

On 11 May 2010, India requested consultations with the European Union and the Netherlands regarding the repeated seizures on patent infringement grounds of generic drugs originating in India but transiting through ports and airports in the Netherlands to third country destinations. India alleges that the measures at issue are, in several respects, inconsistent as such and as applied, with the obligations of the European Union and the Netherlands under Articles V and X of GATT 1994 and under various provisions of the TRIPs Agreement, namely, Article 28 read together with Article 2, Articles 41 and 42, and Article 31 read together with the provisions of the August 2003 Decision on TRIPs and Public Health.

India as a Respondent: Dispute Settlement (DS) 50was filed by the US on 9th July 1996, whereas, Dispute DS 79was filed by theEC on 6th May 1997. Both of these disputes pertained to absence of 'either patent protection orformal systems that permit the filing of patent applications for pharmaceutical and agricultural chemical products and that provide exclusive marketing rights in for pharmaceutical and agricultural chemical products'. On the 5th Sept. 1997 the panel submitted its report and on 19thDec. 1997 the Appellate Body report directed India to comply with the TRIPS provisions of the WTO agreement. In response to this Government of India had introduced a Bill in the Indian Parliament to effect certain Amendments to the Patents Act, 1970. These Amendments to the Patents Act, 1970, as passed by both Houses of Parliament, have been approved by the President of India and notified in the Gazette of India on 26th March 1999 as the Patents (Amendment)Act, 1999.

Conclusion & Suggestions

From the aforesaid deliberation this gathered. The Patent Act of 1970 and the DPCO have not only boosted the development of the Indian pharmaceutical industry but have also contributed to improving health and welfare in India. However, since the mid-1990s, the Indian pharmaceutical industry has faced new challenges onaccount of the WTO-TRIPS Agreement. It was considered that introducing pharmaceutical product patents would have a negative influence on the Indian pharmaceutical industry because it would hamper its growth. The industry can no longer manufacture by reverse engineering or export drugs whose product patents are in effect. However, against expectations, the Indian pharmaceutical industry has been growing the post-TRIPS period and its productivity is improving even in post-TRIPS period. It can be said that the introduction of pharmaceutical product patents has given rise to business opportunities for the Indian pharmaceutical industry and is promoting the growth of the industry.

Indian Pharmaceuticals faces both opportunities and challenges with liberalization of domestic and global market. There is need to develop strategy for an Indian pharmaceutical sector. Appropriate measures are require to move away from the traditionally approach and build a productive and internationally competitive products. Rapid pharma growth is important not only to achieve higher economic growth but also to lift healthcare system in India. The most important suggestion is to increase public investment in a pharmaceutical with a view to robust growth of pharmaceutical sector. Public Pvt. Partnership is a key of development in this sector.

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Prevalence and Molecular Characterization of Glucose-6-Phosphate Dehydrogenase Deficiency among Brahmins and Muslims of Manipur, India

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Abstract

G6PD deficiency offers protection against malaria infection and is strongly associated with the distribution of malaria endemicity. Genetic studies, including those of inherited blood disorders at the molecular levels, are very limited in northeastern India including Manipur. The present study aims to determine the prevalence and its molecular characterization of G6PD deficiency among the Brahmins and the Muslims of Manipur. A total of 263 unrelated blood samples (127 Brahmins and 136 Muslims) was screened for G6PD deficiency using Fluorescent Spot Test. DNA was extracted using salting out method and for molecular analysis, PCR was done using 3 most common Indian mutations (G6PD Mediterranean, G6PD Odisha, and G6PD Kerala & Kalyan) and 4 most common Southeast Asian mutations (G6PD Canton, G6PD Kaiping, G6PD Mahidol and G6PD Union). A higher prevalence frequency of 21.32% of G6PD deficient individuals was found among the Muslims as against the Brahmins with 9.45%. Out of the 7 mutations screened for G6PD that are common to Indian populations, only 4 Brahmins are found to have one each of these mutations. The 4 mutations found among the Brahmins were one G6PD Mediterranean, one G6PD Kerala & Kalyan, and two G6PD Mahidol. The Muslim population with a relatively higher frequency of G6PD deficiency as compared to Brahmin population needs special attention by health planners specifically while administering anti-malarial drugs.

Keywords: *G6PD, Meitei Brahmin, Meitei Muslim, Manipur.*

Introduction

Glucose-6-phosphate dehydrogenase (G6PD) deficiency is a common hereditary enzymatic defect worldwide. It is an X-linked inherited disorder most commonly affecting people of Africa, Asia, Mediterranean or Middle-Eastern descent[1]. It is mainly found in Africa, Asia, and Mediterranean Europe, areas where malaria is endemic, or has been endemic[2]. Other evidence supports the idea of a selective advantage of enzyme-deficient cells with regard to *Plasmodium falciparum*. Almost all cases of G6PD deficiency are caused by one amino-acid change due to a point mutation of the genomic DNA, and about 140 molecular abnormalities of the G6PD genotype have been identified[3]. The worldwide prevalence of G6PD deficiency has been estimated to be around 5%[4] but frequency as high as 70% has been reported among the Kurdish Jews[5]. In India, the

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prevalence varies from 0 to 27.9% across ethnic groups[6]. The average prevalence of Malaria in Manipur is 1,995 per 1,00,000 populations. Rural inhabitants are almost twice as likely to suffer from malaria and the state has seen a substantial increase in malarial cases from 708 to 1,069 (51%) in the year 2009 and an increase in *Plasmodium falciparum* cases has been documented from 356 to 620 during the same period[7]. Only few studies report the prevalence of specific variants and fewer still have reported the prevalence of different G6PD variants at the DNA level in the north-eastern India. Genetic studies, including those of inherited blood disorders at the molecular levels are very limited in this region, including Manipur and such studies may help explain the origin and spread of these disorders and may also shed some light on the history of these ethnic groups. The present study aims to determine the prevalence and its molecular characterization of G6PD deficiency among the Brahmins and the Muslims of Manipur.

Material and Method

Brahmins belong to the larger Manipuri Meitei community of Manipur. Ethno-historically, the Brahmin settlers represent the eastern-most part of the so called Caucasoid types but consequent upon their inter-marriages with Meitei women over a long period of time they show both Caucasoid and Mongoloid features[8]. They inhabit the four valley districts of Manipur namely, Imphal-East, Imphal-West, Thoubal and Bishnupur. But the bulk of the Brahmins is scattered in BamonLeikai of Imphal-East. Muslims are a Caucasoid group, in contrast to the neighboring Mongoloid groups[9]. They spread throughout Manipur and practice consanguineous marriages. However, most of them inhabit the Imphal-East and Thoubal districts of Manipur. The Brahmin samples were collected from Imphal-East district and for Muslims, sampling was done from both Imphal-East and Thoubal districts of Manipur. For screening of G6PD deficiency, a total of 263 (only males) unrelated blood samples (127 Brahmins and 136 Muslims) were collected by finger prick after obtaining prior informed written consent. All the blood samples were tested G6PD deficiency using Fluorescent Spot Test[10]. Intravenous blood (5ml each) was collected from G6PD deficient individuals for further molecular analysis after obtaining prior informed written consent and DNA isolation was done following the standard Salting out method[11]. Molecular analysis was done by using the protocols given in table-1 below.

Results

Out of 127 Brahmin males screened for G6PD deficiency only 12 were found to be deficient with the frequency of 9.45% and of the 136 Muslim males, a higher frequency of 21.32% of G6PD deficient individuals (29) were found among them as shown in Table 2 below. The allele frequencies of G6PD deficiency of Meitei Brahmins (0.0945) and Meitei Muslims (0.2132) are the same as their percentile phenotype frequencies. A Chi square comparison of both the populations with respect to the allele frequencies showed that there is a significant difference between the studied populations ($\chi 2 = 7.0373$; $p= 0.007983$).Of the many mutations reported for G6PD deficiency only 3 most common Indian mutations and 4 most common Southeast Asian variants are selected for the present study. This is because both Brahmins and Muslims are expected to be admixture populations of India and South-East Asian ethnic elements.All the 41 G6PD deficient individuals were screened for the selected 7 mutations. Only 4 individuals out of the 12 Brahmin G6PD deficient could be characterized at the molecular level i.e. G6PD Mediterranean (8.33%) in one individual, G6PD Odisha (8.33%) in one individual and G6PD Mahidol (16.67%) in two individuals, whereas none of the 29 G6PD deficient Muslims could be characterized.

Table 1: Protocols used for molecular characterization of G6PD deficient individuals.

G6PD deficiency variant	Markers	References
Common Indian variants	G6PD Mediterranean (563 C→T)	Kaeda *et al*., 1995
	G6PD Odisha (131 C→G)	
	G6PD Kerala and Kalyan (131 C→G)	Ahluwalia *et al*., 1992
Common South-East Asian variants	G6PD Canton (1376 G→T)	Nuchprayoon*et al*., 2007
	G6PD Kaiping (1388 →A)	
	G6PD Mahidol (487 G→A)	
	G6PD Union (1360 C→T)	

Table 2: Distribution of G6PD deficiency among Brahmins and Muslims of Manipur.

Population	Total No. Tested	G6PD				P-value
		Normal		Deficient		
		No.	Percentile	No.	Percentile	
Meitei Brahmin	127	115	0.9055	12	0.0945	0.007
Meitei Muslim	136	107	0.7868	29	0.2132	

*significant at $p < 0.05$

Discussion

The G6PD deficiency prevalence frequency in India varies from 1% to 27% in different communities and regions of India[12]. In eastern India, the frequency is the highest in Angami Nagas (27.1%), followed by Adi (19.4%), Apatani (16.7%), Nishi (16%), Rabha (15.8%), Mikir (15.6%), Santhal (14.1%), etc.[13]. The distribution of G6PD deficiency among the Brahmins (9.45%) and Muslims (21.32%) of the present study is within the reported ranges of India. The reported frequencies of G6PD deficiency in India vary from complete absence among the Ganchha of Rajasthan[14], Lepchas of Assam[15], Dharwa, Halba and Maria of Madhya Pradesh, and Marathi of Maharashtra[16], Brahmin of Manipur and Jamatia of Tripura[17] to 0.279 among Vataliya Prajapati of Surat, Gujarat[18]. Very limited studies have been carried out in Manipur, the prevalence of G6PD deficiency among the Brahmins was reported to be 2.8%[19] and Kabui (7.8%)[20]. In the north-eastern region of India, the highest frequency (27.1%) has been reported among the Angami Nagas of Nagaland[21]. However, zero frequency has been reported among the Lepchas[15]. Among the populations of the eastern region of India, highest frequency (17%) of G6PD deficiency was reported among the Warli of Orissa[22] followed by Munda and Paraja having the same frequency of 15.9%[23]. The lowest frequency (3.6%) was reported among the Hindus of West Bengal[24]. The frequency of G6PD deficiency in Northern India ranges from 1.5% among the Rajputs of Himachal Pradesh[25] to 12% among the Tharu of North India[17]. The frequencies of G6PD deficiency were also reported among the Dhurwa, Halba and Maria of Madhya Pradesh[16]. The frequency of G6PD deficiency range of western India is 2.1% among the Rajputs of Dadra Nagar Haveli[26] to 27.9% among the Vataliya Prajapati of Surat[18].

Conclusion

The spectrum of mutations causing G6PD deficiency in India has not been well elucidated and several studies have revealed that the G6PD Mediterranean mutation is the most common variant followed by G6PD Kerala-Kalyan and G6PD Odisha[27].The prevalence of G6PD deficiency individuals were significantly high among Muslims as compared to that of Brahmins. However, though 4 common mutations were detected in the Brahmin population, all the 7 common mutations screened for in the populations were found to be absent among Muslim G6PD deficient individuals, suggesting a different origin and migrational history in these two groups which is in conformity to their historical records. Further, the Muslim population with a relatively higher frequency of G6PD deficiency are expected to have mutations that are not common to Indian populations. Hence, the Muslim population needs special attention and further in depth molecular research in respect to G6PD deficiency.

Conflict of Interest: No

Ethical Clearance and Consent: The present study is approved by the Ethical Committee of the Department of Anthropology, University of Delhi. Blood samples were collected after obtaining duly signed prior informed written consent from the participants.

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Efficacy of Technology Basded Method to Improve Knowledge on Health Promoting Behaviour towards Maternal Hypothyroidism among Primi Mothers with Hypothyroidism

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Abstract

Background: Maternal hypothyroidism, in simple terms, refers to low thyroid hormone levels during pregnancy. The diagnosis is made by a TSH that is greater than normal, and this situation deserves therapy. Many studies have shown that maternal thyroid hormones are very important in pregnancy[1]. Most importantly, emerging data seems to suggest that thyroid hormones are especially important for fetal brain development, especially during early pregnancy[2]. Pregnancy has a profound impact on the thyroid gland and thyroid function. The gland increases 10% in size during pregnancy in iodine-replete countries and by 20%–40% in areas of iodine deficiency. Production of thyroxine (T4) and triiodothyronine (T3) increases by 50%, along with a 50% increase in the daily iodine requirement. These physiological changes may result in hypothyroidism in the later stages of pregnancy in iodine-deficient women who were euthyroid in the first trimester[3]. The range of thyrotropin (TSH), under the impact of placental human chorionic gonadotropin (hCG), is decreased throughout pregnancy with the lower normal TSH level in the first trimester being poorly defined and an upper limit of 2.5 mIU/L[4,2].

Aim of the study: To determine teaching primigravida mothers with hypothyroidism on health promoting behaviors towards maternal hypothyroidism has efficacy in improving their knowledge.

Method: Evaluative with Quasi experimental study one group pre and post-test design and Simple random sampling technique were adapted for this study. The knowledge questionnaire regarding health promoting behaviour towards maternal hypothyroidism was distributed among 60 primigravida mothers with hypothyroidism followed by the session of technology based education on health promoting behaviour regarding maternal hypothyroidism was given to the primigravida mothers. The data were analysed by using descriptive, inferential statistical method.

Result: In pre-test the mean score of knowledge level is 9.45 and the SD is 3.13. In the post test the mean score of knowledge level is 20.06 and the SD is 11.40, which shows that the technology based education on health promoting behaviour of maternal hypothyroidism is highly significant in improving knowledge.

Keywords: *Primigravida mothers, hypothyroidism, health promoting behaviour, technology based method, knowledge.*

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Introduction

Hypothyroidism is a relatively common illness in pregnancy. Between 2.2% and 2.5% of women have been found to have serum thyroid stimulating hormone (TSH) levels of 6 mU/L or greater at 15 to 18 weeks' gestation. Raised maternal serum TSH in the second trimester is also associated with an increased rate of fetal death

after 16 weeks' gestation[5]. Emerging research indicates that thyroid hormones play a key role in fetal brain development, and asymptomatic hypothyroidism during pregnancy may have an adverse effect on fetal growth and neurologic development. Findings published in the past year call our attention to the importance of identifying and adequately treating thyroid-deficient gravidas: Maternal free thyroxine (FT4) concentration below the 10th percentile at 12 weeks is associated with significant impairment of psychomotor development at ages 1 and 2 years[6]. The average serum thyroid-stimulating hormone (TSH) and FT4 levels of neonates born to hypothyroid mothers were significantly higher than those of controls; birth weight and head circumference were significantly lower[7]. Treatment and awareness of maternal hypothyroidism is essential, because adverse outcomes for both mother and baby are greatly reduced, if not eliminated, when patients are treated. Even when treatment is initiated later in pregnancy or is insufficient to restore a euthyroid state, the babies of treated mothers will show more normal neurodevelopment than the babies of non-treated mothersi[8,9].

Objectives: To assess and associate the pre and post intervention of knowledge on health promoting behaviour towards maternal hypothyroidism among primigravida with hypothyroidism with the selected demographic variables.

Hypothesis: Hypothesis were tested at 0.05 level of significance.

H1: There will be significant difference and association in the pre and post-test knowledge and score and their selected demographic variables.

Method and Materials

Research Methodology:

Research Design: Evaluative with Quasi experimental study one group pre and post-test design.

Setting: Narayana Hrudayalaya Hospital, Narayana health city, Bangalore.

Population: The target population for the study includes the primi gravida mothers with hypothyroid with TSH level more than 2.5 mlU/L (I^{ST} trimester) and Free T4 ((thyroxin) decreased with compare to normal. Primigravida mothers attending antenatal OPD in Narayana Hrudayalaya Hospital, Narayana health city, Bangalore.

Sample Size: 60 primigravida mothers with hypothyroidism

Sampling Technique: Simple Random Sampling technique

Independent Variable: Technology based education.

Dependent Variable: Knowledge regarding health promoting behaviour towards maternal hypothyroidism

Sampling criteria

Inclusion criteria:

Antenatal mothers who have:

- Primigravida mothers
- age above 20 years
- Willing to participate in the study.
- Gestational age 1- 12 weeks.
- Registered and attending the antenatal OPD for visits.
- The antenatal mother whose laboratory values falls below criteria:
- TSH level more than 2.5 mlU/L (I^{st} trimester)
- Free T4 ((thyroxin) decreased with compare to normal (Normal reference range- 0.8 -2.8 nanograms per deciliter (ng/dL))

Exclusion Criteria:

- Health professional mothers
- Mothers coming in antenatal OPD in Gestational age of above 13 weeks

Ethical Consideration: The study was conducted after approval from the concerned institution. Assurance was given to the participants regarding the confidentiality.

Description and Development of the Tool:

The tool comprised of 3 sections:

Section A: The demographic variables of the clients.

Section B: Structured Questionnaire on Knowledge regarding Health Promoting Behaviour of Mothers with Hypothyroidism.

Section C: Technology Based method on Maternal Hypothyroidism (Intervention Module)

Sl.No.	Topics	Method of Technology
1	Meaning, causes, risk factors and symptoms of maternal hypothyroidism	Power Point Presentation
2	Adverse Outcomes of Maternal Hypothyroidism (Maternal & Foetal Disorders)	
3.	Screening & Monitoring	Video assisted teaching
4.	Modification of Diet & Activity	
5.	Guidelines for maternal and Newborn care	CD instruction

Scoring Technique:

Section A: Scoring key for demographic data variables.

It consists of antenatal mothers profile such as age in years, type of family, type of food, occupation, monthly income, educational status and source of awareness of maternal hypothyroidism.

Section B: Scoring key for structured interview schedule format.

Knowledge questionnaire consists of 30 questions to assess knowledge. Each correct answer was given a score of one mark and wrong answer or unanswered was given a score of '0'. The maximum score was 30.

Classification of knowledge score based on arbitrary division

Below 50%	Inadequate Knowledge
50-75%	Moderate adequate knowledge
76% and above	Adequate knowledge

Procedure for data collection: The data was collected after the written informed consent obtained from primigravida mothers with hypothyroidism. The pre-test was conducted for primigravida mothers during their first antenatal visit (3rd months) about 15 minutes followed by technology based training to the antenatal mothers with hypothyroidism for 30 minutes. The post test was conducted to the same primigravida mothers during their 3rd antenatal visit at the month of 7th months.

Data Analysis Plan:

The plan of data analysis was as follows:

- Organize data in a master sheet or computer.
- Demographic data would be analyzed in terms of frequency and percentage.
- The knowledge of maternal hypothyroid mothers regarding health promotion behaviour before and after intervention of technology based approach analyzed in terms of frequency and percentage, mean, Standard deviation.
- The significance of the difference between pretest and posttest knowledge score determined by paired 't' test.
- The association between the pre- test levels of knowledge score with demographic variables would be determined by using "Chi-Square".

The analysis of the data was mainly classified as:

Section-A: Frequency and percentage distribution of socio demographic variables of primigravida mothers with hypothyroidism.

Table 1: Frequency and percentage distribution of sample characteristics: n = 60

Sl.No.	Sample Characteristics	Frequency	Percentage
1. Age (in Years):			
a.	20-25	10	16.67
b.	26-30	10	16.67
c.	31-35	18	30.00
d.	36 and above	22	36.66
2. Type of Family:			
a.	Nuclear family	37	61.67
b.	Joint family	23	38.33
3. Occupation:			
a.	House wife	31	51.67
b.	Private employee	15	25.00
c.	Government employee	14	23.33
4. Educational Status:			
a.	Primary school	36	60.00
b.	High school & above	18	30.00
c.	Graduation & above	6	10.00

Sl.No.	Sample Characteristics	Frequency	Percentage
5. Food habits:			
a.	Vegetarian	37	61.67
b.	Non vegetarian	23	38.33
6. Family Income per Month (in Rs):			
a.	Below 3000	21	35.00
b.	3001 – 6000	14	23.33
c.	6001-9000	15	25.00
d.	9001-12000	4	6.67
e.	Above 12000	6	10.00
7. Information sources about the illness:			
a.	Mass media (TV, Radio, News Paper, Magazine)	21	35.00
b.	Professionals (Doctor, Nurses, Health Personnel)	18	30.00
c.	Friends	13	21.67
d.	Relatives	8	13.33

Section B: Structured Questionnaire on Knowledge regarding Health Promoting Behaviour of Mothers with Hypothyroidism.

Table: 2 Pre- test level of knowledge regarding health promoting behaviour of primigravida mothers with Hypothyroidism.

Knowledge level regarding health promoting behaviour on maternal hypothyroidism	Knowledge levels					
Pre-test Overall level of knowledge	Inadequate Below 50%		Moderate 51 – 75%		Adequate Above 75%	
	No	%	No	%	No	%
	50	83.3	10	16.7	00	00

Table No - 2 shows that overall pre-test level of knowledge scores regarding health promoting behaviour of antenatal mothers with Hypothyroidism.

Majority 50 (83.3%) of them had inadequate level of knowledge, 10 (16.7%) of them had moderate level of knowledge and none of them were had adequate knowledge.

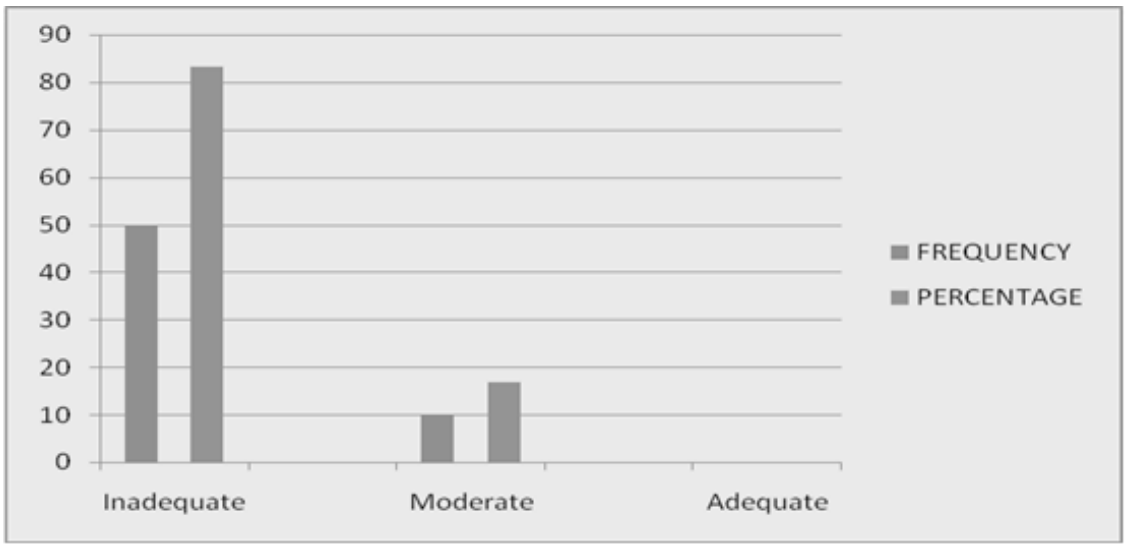

Fig No. 1: Pre- test level of knowledge regarding health promoting behaviour of primigravida mothers with Hypothyroidism

Table No. 3: Post- test level of knowledge regarding health promoting behaviour of primigravida mothers with Hypothyroidism

Knowledge regarding health promoting behaviour on maternal hypothyroidism	Knowledge levels					
Post-test Overall level of knowledge	Inadequate Below 50%		Moderate 51 – 75%		Adequate Above 75%	
	No	%	No	%	No	%
	00	00	15	25	45	75

Table 3 shows that overall post-test level of knowledge scores regarding health promoting behaviour of antenatal mothers with Hypothyroidism

Majority 45(75%) of them had adequate level of knowledge, 15 (25%) of them had moderate level of knowledge and none of them were had inadequate knowledge.

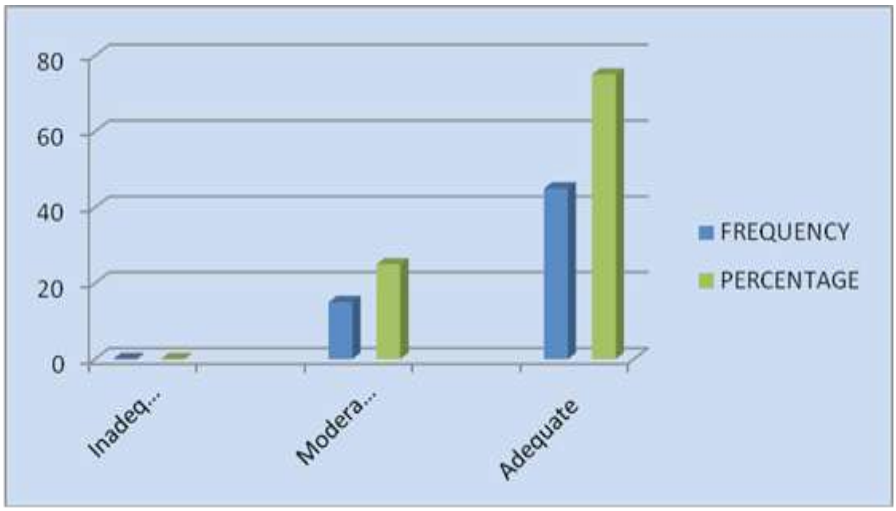

Fig. No. 2: Post- test level of knowledge regarding health promoting behaviour of primigravida mothers with Hypothyroidism

Table No. 4: Mean, standard deviation and paired 't' value of pretest and posttest knowledge scores regarding health promoting behaviour of primigravida mothers with Hypothyroidism

Test	Mean	Standard deviation	Paired 't' value
Pre- test	9.45	3.13	19.68
Post- test	20.06	11.40	D f = 59

T_{tab} = 2.2, P< 0.05 level

Table No. 4 Represents that the mean post-test knowledge score (20.06) is apparently higher than mean pre-test knowledge score (9.45). Standard deviation of post test score is (11.40) and standard deviation of pre-test score is (3.13) and the computed paired 't' test value (t59 = 19.68, P< 0.05) is greater than the table value (t_{tab} = 2.2) which represents significant gain in knowledge through the technology based approach.

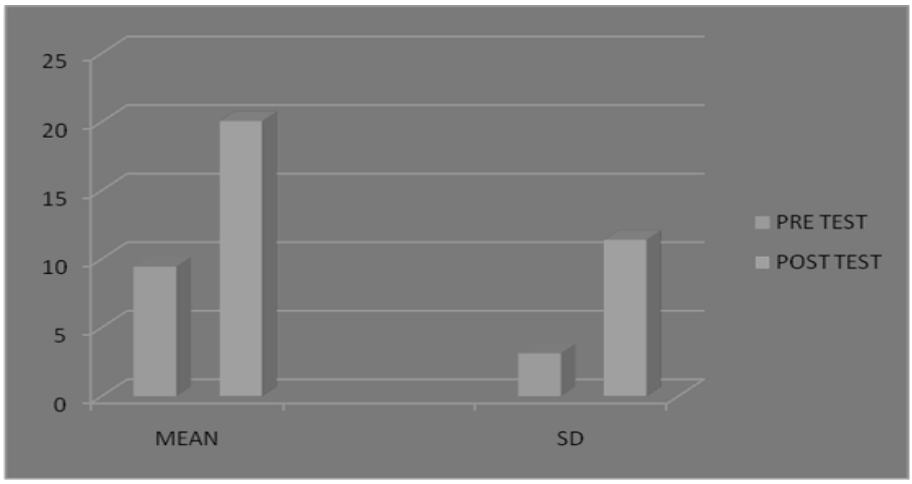

Fig. No. 3: Mean, standard deviation and paired 't' value of pre-test and post-test knowledge scores regarding health promoting behaviour of primigravida mothers with Hypothyroidism

The hypothesis stated as follows:

H1: The mean post-test knowledge score will be significantly higher than the mean pre-test knowledge score of the primigravida mother with hypothyroidism. The findings indicated that the computed Paired 't' test value 19.68 is greater than t table value (2.2). So that the researcher reject the null hypothesis and accepted the research hypothesis

The association between the pre- test levels of knowledge score with demographic variables would be determined by using "Chi-Square" revealed that there was no significant association between level of knowledge score and selected variables such as age, level of education, occupation, type of family and sources of information.

Conclusion

The findings reveal that the majority of primigravida mothers with hypothyroidism had inadequate knowledge regarding hypothyroidism during pregnancy. It indicates that there is a need for creating awareness and regular follow up. The researcher concludes that creating awareness through the technology based had more impact and the subjects were shown more interest and received the teaching content with highly motivated. Hypothyroidism in pregnancy is associated with adverse fetal and maternal outcomes. Women with thyroid disorders should be followed closely and motivate them throughout pregnancy by maintaining daily check, telephonic reminder, text messages to the antenatal mothers hypothyroidism for the prevention of maternal complications, and good perinatal outcome.

Interest of Conflict: None

Source of Funding: Funded by the primary researcher

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Effect of Water Aerobic and Aerobic Exercise on VO2 Max Parameter among College Men Students

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Abstract

The motivation behind the present review was to research the impact of water cardio respiratory endurance and oxygen consuming activities on vo2 max parameter among school men understudies. To accomplish the reason for the review thirty school men understudies were chosen from Erode in the year 2018-19. The subject's age ranged from 18 to 25 years. They chose players were isolated into three equivalent gatherings comprises of 10 men understudies each specifically test aggregate I, exploratory gathering II and control gathering. The test bunch I experienced water vigorous exercise and trial assemble II experienced oxygen consuming activities for a month and a half. The control gathering was not partaking in any activity over the span of the review. The reliant variable vo2 max was taken as standard factors and they were tried by utilizing cooper vo2 max test for this review .Pre-test was taken before the activity timeframe and post-test was measured instantly after the a month and a half of preparing period. Factual procedure "f" proportion was utilized to break down the method for the pre-test and post test information of test gatherings and control gathering. The outcomes uncovered that there was a huge distinction found on the paradigm factors.

Keywords: *Water aerobic exercises, Aerobic exercises, Vo2 max, Pre Test and Post Test.*

Introduction

Cardio-Respiratory Endurance: Oxygen consuming activity is any physical movement that requires the heart rate to reach no less than 60% of the maximal heart rate for an augmented timeframe. It is a movement that can be supported for an augmented timeframe without building up an oxygen deficiency. High-impact practice program is to expand the most extreme measure of oxygen that the body can handle inside a given time which is termed as "High-impact limit". It is a required capacity to ¹ quickly inhale a lot of air.[2] It conveys substantial volumes of blood with compulsion.[3] It conveys oxygen to all parts of the body in an adequate amount. To put it plainly, it relies on effective lungs, a capable heart, and a decent vascular framework which shows the states of these crucial organs, the high impact exercise limit is considered to be the best for improving general physical wellness.

Water Aerobics: Water vigorous exercise, sea-going wellness, water wellness, water fit which are the water high impact exercises involve in the execution of oxygen consuming activity in genuinely shallow water, for example, in a swimming pool.[4] Done for the most part vertically and without swimming ordinarily in abdomen profound or more profound water, it is a sort of resistance preparing. Water vigorous exercise is a type of high-impact practice that requires water-submerged members. Most water vigorous exercise is in a gathering wellness class setting with a prepared proficient instructing for 60 minutes. The classes concentrate on high-impact perseverance, resistance preparing, and making a pleasant environment with music. Distinctive types of water vigorous exercise include: water high impact exercise, and water run. While like land high impact exercise, in that it concentrates on cardiovascular preparing, water vigorous exercise varies in that it includes the part of water resistance and lightness.[5]In spite of the fact that heart rate does not increment as much as in land-based high impact exercise, the heart is working similarly as hard and submerged exercise really draws more blood to the heart. Practicing in the water is vigorous, as well as quality preparing focused because of the water resistance. Moving your body through the water makes a resistance that will initiate muscle gatherings. Hydro heart stimulating exercise is a type

of a vigorous exercise that requires water-submerged members.[6]

Statement of the problem: The research aims to assess the impact of water cardio respiratory endurance and oxygen consuming activities on vo2 max parameter among school men understudies.

Methodology

The motivation behind the present review was to explore the impact of water Cardio respiratory endurance and vigorous exercise on the vo2 max parameter of school men competitors. The accomplish this review was haphazardly chosen forty five school men understudies from Erode locale swimming pool relationship amid the year 2016-17 and their age gone from 18 to 25 years. The chosen subjects (N=45) were isolated into three gatherings similarly and arbitrarily. Forty five subjects from school men understudies were haphazardly chosen and they were allocated into three equivalent gatherings. Each gathering comprised of fifteen subjects. Of which Experimental Group I experienced Water oxygen consuming activities (WAEG), Group II experienced Cardio respiratory endurance activities (Aerobic Exercises) (AEG) and Group III gone about as Control Group (CG). The two test gatherings were treated with their individual preparing for one hour for each day for three days seven days for a time of a month and a half.

Water aerobic exercises group performed 10 drills namely toning arms, jumping jacks, side stretch, total body stretch, standing kick backs, leg adduction and abduction, crunch and floating on water. Aerobic exercises group performed 10 drills namely v step, turn step, over the top, L step, basic straddle step, side to side, double step side, knee kick, kick forward, kick sideward. This aqua aerobics exercises group and aerobic exercises group starts with 3 set of 12-10 repetitions in the first two weeks and progressed to 4 set of 10-8 repetitions in the second two weeks and 5 sets of 8-6 repetitions in the last two weeks. 30sec rest was given in between the sets. As the intensity start with 60% for first four weeks, 10% of intensity was increased for every two weeks. The subjects of all the three groups were tested on vo2 max prior to and after the training period. To ascertain vo2 max was used and accordingly cooper vo2 max test was administered mean value count by ml/min/kg.

Statistical Analysis: The significance of the difference among the means of experimental group was found out by pre-test. The data were analyzed analysis of covariance (ANCOVA) technique at .05 levels as confidence. Analysis was performed using SPSS 20.0 (SPSS Inc Software).

Results and Interpretations

Table I: Means Values for water aerobic exercises Group, Cardio Respiratory Endurance and Control Group on Vo2 Max (Cooper vo2 max test Mean value count by ml/min/kg)

Test	Water aerobic exercises	Cardio respiratory endurance	Control Team	Source of varaiance	Sum of Square	Df	Mean Square	F Ratio	Table value
PTM	38.46	30.74	37.03	Between	3.711	2	1.856	0.842	3.45
SD	2.02	1.50	1.29	Within	112.795	42	2.686		
PT	38.92	39.24	33.01	Between	112.035	2	56.017	32.03*	3.35
SD	1.36	1.22	1.37	Within	73.486	42	1.75		
APTM	36.42	36.20	36.34	Between	105.923	2	52.962	40.12*	3.43
				Within	55.32		1.349		

*Significant .05 level of confidence

The table I demonstrated that the pre□test mean esteems on vo2 max for water oxygen consuming activities gathering, cardio respiratory endurance gathering and control gathering are 38.46,30.74 and 37.03 individually. The result of "F" proportion 0.842 for pre□test mean was not as much as the table esteem 3.45 for df 2 and 42 required for importance at 0.05 level of certainty on vo2 max. The post□test mean esteems on vo2 max for water oxygen consuming activities gathering, Cardio respiratory endurance gathering and

control gathering are 38.92, 36.08 and 33.01 individually. The result of "F" proportion 32.03* for post□test mean was more noteworthy than the table esteem 3.35 for df 2 and 42 required for criticalness at 0.05 level of certainty on vo2 max . The adjusted post□test method for water oxygen consuming activities gathering, Cardio respiratory endurance gathering and control gathering are 36.42, 39.24 and 36.34 individually. The got "F" proportion 40.12* for adjusted post□test mean was more noteworthy than the table esteem 3.43 for df 2 and 41 required for centrality at 0.05 level of certainty on vo2 max. Since the got "F" proportion esteem was critical further to discover the matched mean distinction, the Scheffe's post hoc test was utilized and exhibited in table II.

Table II: Cooper vo2 max test Mean value count by ml/min/kg

Means			Mean Difference	Required CI
Aqua aerobic exercises	Aerobic exercises	Control Group		
36.42	36.195	-	.330	1.07
36.42	-	33.053	3.266*	1.07
-	36.195	33.053	3.432*	1.07

*Significant 0.05 level of confidence

The table II demonstrates that the adjusted post-test mean contrast in vo2 max between water aerobic gathering and oxygen consuming activities gathering is .330 it is critical at 0.05 level of certainty and demonstrated there was an inconsequential change. Water oxygen consuming activities gathering and control gathering is 3.266* it is huge at 0.05 level of certainty and demonstrated there was a huge change. Oxygen consuming activities gathering and control gathering is 3.432* it is critical at 0.05 level of certainty and demonstrated there was a huge change. Henceforth, there was critical distinction amongst control and test bunches in vo2 max among school men understudies. The after effects of the review demonstrated that there were a critical contrast between water aerobic gathering and control gathering, oxygen consuming activities gathering and control assemble on vo2 max.

Discussion on Findings

The investigator was convinced with the results that the group training in vo2 max with the aqua aerobic exercises and aerobic exercises improve vo2 max. The training given to the experimental group with aqua aerobic exercises and aerobic exercises had an influence on the experimental group and had shown improvement in vo2 max than the control group in the final test. The training given to the experimental group was planned by the investigator in consultation with his guide and with great care. The investigator felt that anyone could become good athletes if he has good vo2 max.

Conclusions

Significant improvement occurred in vo2 max on college men students.

1. Experimental groups with water aerobic exercises performed better than the aerobic exercises and control group.
2. Experimental groups with aerobic exercises performed better than the control group.

Ethical Clearance: Nil

Source of Funding: Self

Conflict of Interest: Nil

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Assessment of Different Types of Malocclusion Using IOTN Index and Geographic Information System: A Cross-sectional Observational Study

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Abstract

Objective: Beauty is often considered as one of the most pleasant aspects of life, and its influence is often almost unavoidable. A person's dental appearance has a significant bearing on his psychological well-being. The various research studies conducted in India have shown prevalence of malocclusion ranging from 20 to 55%.

Method: A cross-sectional Descriptive survey was planned in the school children of Mysuru district. The sample size was 840 subjects. To assess the prevalence of malocclusion and different types of malocclusion present, DHC of the IOTN was used. GIS mapping of prevalence and frequency of different malocclusions was done using Arc GIS software.

Results: The IOTN classification reveals that among 409 Boys, 121 (29.6%) had definite need for orthodontic treatment. Among 436 girls, 124 (28.4%) had definite need for orthodontic treatment. There was no statistically significant difference with regard to orthodontic treatment need between boy and girl study participants in the present study (p = 0.53).

Conclusion: The prevalence of malocclusion is 58.2 & and displacement is the commonest type of malocclusion present.

Keywords: *Malocclusion, Orthodontic Treatment Needs, IOTN Index, Geographic Information System (GIS).*

Introduction

Health is the extent of functional or metabolic regulation of a living body[1]. Oral health connects with other health systems of the body. Malocclusion is a misalignment or incorrect relation between the teeth of the two dental arches when they approach each other as the jaws close[2]. Malocclusion varies from country to country and also among different races. The reported incidence according to previous studies has a broad range varying from 39% to 93% which reveals that majority of the children have malocclusion. The reason for this broad divergence may be because of the differences in ethnic groups, variations in the age group of the sample in different studies and most importantly because of the differences in the method of registration[3].

India is a vast and a developing country. Our country is striving to put an end to the many health related disorders. The results of the epidemiological studies on malocclusion not only helps in planning

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orthodontic treatment but also offers a rational approach for determining the etiological factors of malocclusions[4].

Scenario of malocclusion in different states of India (Table 1). Following are some of the states wherein the epidemiological data about malocclusion is available[5,6].

A Geographic Information System (or GIS) is a system which is designed to capture, store, manipulate, analyse, manage and present spatial or geographical data. GIS technology is a powerful aid for public health profession as it provides data which can be used to communicate important facts about community. Also, GIS ties health to where people live.

The objectives of this study are:

1. To assess the severity of malocclusion in 12-year-old school going children of Mysuru district,
2. To assess the different types of malocclusion present in 12-year-old school going children of Mysuru district,
3. To locate the different types of malocclusion present in 12-year-old school going children of Mysuru district using the Geographic Information System (GIS) Data.

Materials and Method

Study Design: A cross-sectional descriptive survey was planned in the school children of Mysuru district.

Study Setting: The epidemiological survey was planned to be conducted in four taluks of Mysuru district. Three grades of school i.e., Government school, Private aided and Private Unaided school in the four taluks of Mysuru district were considered.

Sample and Sampling Technique: Sample size was determined using sample size formula for prevalence study. The prevalence rate was fixed at 40% and relative precision was 0.12. The sample size obtained was 840 subjects.

Two stage sampling was planned for the present study. In the first stage of sampling, four taluks were selected using simple random sampling by lottery method. Out of 840 subjects, 210 subjects were equally distributed to four taluks of Mysuru district. In the second stage of sampling, from each Taluk, schools were selected randomly to include 210 subjects by lottery method. In each school children in the age group of 12 years were chosen using the class Attendance register.

Inclusion Criteria:

1. Children of 12 year old in the sampled schools.
2. Children who provided both informed consent from parents and informed assent to participate in the study.

Exclusion Criteria:

1. History of previous orthodontic treatment.
2. Children undergoing orthodontic therapy.
3. Rampant caries
4. Any other craniofacial anomalies and syndromes.

Ethical considerations- Prior permission to conduct the survey was taken from the Deputy Director Public Instructions (DDPI) and also from the concerned school authorities. The survey protocol was reviewed and approved by the Institutional Review Board. Informed consent and Informed Assent were given a week prior to the parents of the child and the child. Only those children who provided both informed assent and consent were included in the survey.

Data Collection: To assess the normative orthodontic treatment need, DHC of the IOTN was used.

The examination was carried out under bright day light in the school premises. Sufficient sterilized instruments were carried out to the school on the day of examination.

Data Entry: At the end of each day of the survey, the data were entered to the personal computer by the investigator. Data were coded and entered into excel sheet. 10% of the observations were randomly selected and cross-checked to detect any error and to validate the data entry. At the end of the survey, the data were scrutinized again and was handed over to the Statistician.

Statistical Analysis-Data were transformed into SPSS Windows version 16, where cleaning, coding, recoding, cross-checking, and processing and analysis were done by the statistician.

The following statistical tests were applied.

1. Frequency
2. Descriptive
3. Cross-tabulations (Contingency table analysis)
4. Chi-square test.

GIS Mapping:

The Base Map Creation: The Base Map for the study is a district and taluk outer boundary layer that was created for Mysuru district. The individual taluk maps and the district map was merged together to create the overall study area map. The information different types of malocclusion for each taluk and for Mysuru district was incorporated into the baseline map and the maps depicting the frequency of different types of malocclusion for each taluk and the Mysore district was created using Arc GIS software.

Findings: Abundant epidemiological data relating to malocclusion have been published by many others in the developed countries. The number of studies is limited in India due to the orthodoxy of Indian culture.

We have selected 13 schools in 4 taluks of Mysuru district (Government, Private aided and Private un-aided schools) and 845 participants were used for the study. Out of the 845 participants, 409 (48.4%) were boys and 436 (51.6%) were girls.

The malocclusion/IOTN classification reveals that among 409 Boys, 163 (39.9%) had little need for orthodontic treatment while 125 (30.6%) had moderate need and 121 (29.6%) had definite need for orthodontic treatment. Among 436 girls, 190 (43.6%) had little need for orthodontic treatment while 122 (28%) had moderate need and 124 (28.4%) had definite need for orthodontic treatment. There was no statistically significant difference with regard to orthodontic treatment need between boy and girl study participants in the present study ($p = 0.53$),

Prevalence of different types of malocclusion in relation to gender

Among 409 Boys:

- 04 (1%) had Missing teeth,
- 153 (37.4%) had an increased Overjet,
- 35 (8.6%) had Cross bite,
- 191 (46.7%) had Displacement and
- 26 (6.4%) had Overbite.

Among 436 girls:

- 03 (0.7%) had Missing teeth,
- 184 (42.2%) had an increased Overjet,
- 32 (7.3%) had Cross bite,
- 198 (50.9%) had displacement and
- 19 (4.4%) had overbite.

Displacement of teeth was the most common malocclusion trait followed by an increase in Overjet among both Boys and girls in the present study with Missing teeth being the least prevalent. However, the difference in the distribution of these malocclusion traits between Boys and girls was not statistically significant ($p = 0.48$). This was evident even when a separate comparison was made among participants from Mysuru ($p = 0.94$), Nanjangud ($p = 0.38$), Hunsur ($p = 0.07$) T-Narsipurtaluk ($p = 0.07$) (Table 2)

Mapping of different traits of malocclusion- This was done using Arc GIS software.

Table 1: Epidemiology of Malocclusion- Indian Scenario

Sl No.	State	Author	Malocclusion Status
1.	Himachal Pradesh	Chauhan et al	31% severe malocclusion
		Pruthi et al	53% malocclusion
2.	Rajasthan	Trehan et al	66.7%
		Dhar et al	36.42%
3.	Andhra Pradesh	R Muppa et al Suma S et al	14.3% class I 9.95% class II 5.33% Class III 20.8% Urban 14.9% Rural
4.	Kerala	Jacob PP et al	49.2%

Sl No.	State	Author	Malocclusion Status
5.	Tamil Nadu	Kannappan et al	19.6%
		Radha Krishna et al	62.5%
		Joseph John et al	25.1% Definite malocclusion 6.2% Handicapping malocclusion
6.	Delhi	Kharbanda et al	91.6% class I 4.6% Class II 3.4% Class III
7.	Madhya Pradesh	Jalili VP et al	14.4%
8.	Haryana	Gauba K et al	14.4% class I 13.5% class II 1.3% class III
		Singh et al	55.3%
9.	Punjab	Robert S et al	Crossbite
10.	Chattisgarh	Ashok Kumar D et al	2.9% Definite malocclusion 25% Severe malocclusion 1.4% Handicapping malocclusion
11.	Uttar Pradesh	Singh M et al	34.09%
12.	Maharastra	JT Nainani et al	77.9% class I 5.04% class II 2.5% class III
13.	Gujarath	Joshi et al	spacing
14.	Karnataka	Rao DB et al	23% class I 4.5% class II 1.3% class III
		Shivakumar KM et al	3.7% Severe malocclusion 15.7% Moderate malocclusion 80.1% Little/No malocclusion
		Prasad AR et al	51.5%- 85.7%
		Sandesh Phaphe et al	17.8% class I 30.1% Class II 1.6% class III
		Roopa et al	32.8%

Table 2: Prevalence of various malocclusion traits in relation to gender among participants in four taluks of Mysuru district

Sl. No.	Taluk Name	Missing teeth		Overjet		Crossbite		Displacement		Overbite		Total		Statistical inference
		Boys N (%)	Girls N (%)	Boys N (%)	Girls N (%)	Boys N (%)	Girls N (%)	Boys N (%)	Girls N (%)	Boys N (%)	Girls N (%)	Boys N (%)	Girls N (%)	
1.	Mysuru	1(33.3) (2.1)	2(66.7) (3.8)	16(45.7) (34.0)	19(54.3) (35.8)	11(45.8) (23.4)	13(54.2) (24.5)	18(51.4) (38.3)	17(48.6) (32.1)	1(33.3) (2.1)	2(66.7) (3.8)	47(47.0) (100)	53(53.0) (100)	X^2: 0.76 df: 4 p: 0.94
2.	Nanjangud	1(50.0) (0.6)	1(50.0) (0.7)	74(54.4) (46.2)	62(45.6) (41.1)	10(71.4) (6.2)	4(28.6) (2.6)	72(47.7) (45.0)	79(52.3) (52.3)	3(37.5) (1.9)	5(62.5) (3.3)	160(51.4) (100)	151(48.6) (100)	X^2: 4.20 df: 4 p: 0.38
3.	Hunsur	2(100) (2.0)	0(0) (0)	38(45.2) (38.0)	46(54.8) (53.5)	10(47.6) (10.0)	11(52.4) (12.8)	40(60.6) (40.0)	26(39.4) (30.2)	10(76.9) (10.0)	3(23.1) (3.5)	100(53.8) (100)	86(46.2) (100)	X^2: 8.54 df: 4 p: 0.07
4.	T-Narsipura	0(0) (0)	0(0) (0)	25(30.5) (24.5)	57(69.5) (39.0)	4(50.0) (3.9)	4(50.0) (2.7)	61(44.5) (59.8)	76(55.5) (52.1)	12(57.1) (11.8)	9(42.9) (6.2)	102(41.1) (100)	146(58.9)	X^2: 6.97 df: 4 p: 0.07
Total		4(57.1) (1.0)	3(42.9) (0.7)	153(45.4) (37.4)	184(54.6) (42.2)	35(52.2) (8.6)	32(47.8) (7.3)	191(49.1) (46.7)	198(50.9) (45.4)	26(57.8) (6.4)	19(42.2) (4.4)	409(48.4) (100)	436(51.6) (100)	X^2: 3.49 df: 4 p: 0.48

Discussion

The prevalence of malocclusion had been found to vary with the different population, race and origin[7]. A similar study in Travancore population[8] in Kerala reported 53.3% in need of orthodontic treatment. However, studies done by Singh S et al[9], Narayan RK et al[10] showed 68.4% and 83.8% in need of orthodontic therapy. This difference could because the latter studies were done on the adolscent subjects.

Distribution of malocclusion in population showed that a maximum number of children i.e. 46% presented with Displacement, 39.9% presented with increased overjet, 7.9% presented with crossbite, 5.3% presented with increased overbite and 0.8% presented with missing teeth. The increased frequency of displacement and overjet in the study population can be explained by the fact that there is reduction in the jaw size with evolution and due to the transition of diet from coarse to soft. These results are in accordance with the results of other studies by other researchers[11].Our finding that displacement is the most common feature (46%) contrast with that of Tania Arshad et al[12]. Increased overjet is an obvious sign of malocclusion in one's mouth and patients presenting to clinics will be to some extent aware of their malocclusion status whereas patients presenting displacement may or may not be aware of their clinical malocclusion. The results of our study are also supported by a study done by Borzabadi- Farahani et al[13].

While applying statistical technique we found that there was no statistically significant difference between the type of malocclusion and gender. This is in accordance with the study done by Grand G et al, Kashif Aslam et al, Reddy et al, Onyeaso CO et al, Kaur H et al and Lauc T et al[14-19].

Conclusion

The observations recorded from our study are as follows:

The prevalence of malocclusion was 58.2% as recorded by IOTN.

The malocclusion parameters as recorded by the modified version of IOTN index is as follows,

- Missing teeth- missing teeth is observed in 0.8% of the subjects.
- Overjet- overjet is observed in 39.9% of the subjects.
- Crossbite- crossbite is observed in 7.9% of the subjects.
- Displacement- displacement is observed in 46% of the subjects.
- Overbite- overbite is observed in 5.3% of the subjects

Source of Funding: Self

Conflict of Interest: Nil

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Hair Mercury Exposure and Hypertension among Community Artisanal and Small Scale Gold Mining in Banten, Indonesia

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Abstract

Background: Mercury was a heavy metal that persistent in the environment and harmful to human health and still used by Artisanal Small Scale Gold Mining (ASGM), especially in Indonesia. Cimanggu was one of ASGM in Banten province who still active using mercury and had found high levels of mercury that exceed the threshold in wastewater and human hair. Mercury exposure can affect human health, such as hypertension. This research aimed to determine the levels of hair mercury, hypertension, and individual characteristics such as age, sex, and smoking habits. And also determine the association between hair mercury with hypertension among communities in ASGM.

Material and Method: Design studies in this research using cross-sectional design. The data from BBTKLPP Jakarta datasheet "Analysis of Potential Impact of Risk Factors Environment Based for Disease Outbreaks on Interest Mining Society". Retrieved data was hair mercury that analyzed in the laboratory BBTKLPP Jakarta using Mercury Analyzer (MA) 3000 with cold pavor method and blood pressure were measured directly two times using sphygmomanometer merk ABN and individual characteristics taken through a questionnaire. Totaling 100 samples analyzed were taken by quota sampling. Findings: Univariate test showed that most of the respondents had abnormally hair mercury levels (55%), hypertension 29%, woman 78%, smoking 23%, and > 40 years 46%. Chi-square test showed no significant association between hair mercury levels and hypertension (P value=1, OR= 1.01, 95% CI = 0.42-2.40).

Conclusion: Respondents who had normal or abnormally hair mercury levels had the same odds to have hypertension risk. Further research is needed by using a larger sample with high-intensity process mercury use to clarify the association of hair mercury levels with hypertension.

Keywords: *Mercury; hypertension; Artisanal and Small Scale Gold Mining (ASGM).*

Introduction

Mercury emissions in the environment can from human activities such as fossil fuels burning, solid waste burning, and Artisanal Small Scale Gold Mining (ASGM)[(1)]. In the ASGM, mercury used to extract gold from the seeds by forming an amalgam. The widespread of mercury use in ASGM because simple to use, can be done individually, and relatively quick to separate the gold. Globally around 15 million people, including 3 million women and children participate in ASGM in 70 countries[(2)]. Based on the survey results consisting of 800 ASGM in Indonesia with estimated 250,000 miners and 1 million, whereas women and children[(3)]. ASGM had an increase in Indonesia. It's in line with many studies have shown that mercury pollution has occurred the sea, sediments, water wells, fishes, plants, and communities have an impact on public health[(4–6)]. Such as Hartono research which found mercury exposure in fish in Buyat Bay and Teluk Ratotok which has improved health for people who consume air from the Ratotok River Estuary,

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Buyat River Hulu, and clean water/drinking water storage PT. Newmont Minahasa Raya[7]. The results of a study conducted in ASGM Gorontalo showed that the concentration of hair mercury respondents had exceeded the established standard of 2 with an average concentration of hair mercury in 5.0480 ppm[8].

ASGM donate 37% of mercury emissions in air and water. Mercury vapor present in the air around ASGM always high and the mercury pollution in water almost exceeds the quality standards by WHO. Continuously exposure can affect the central nervous system, the reproductive system and the cardiovascular system[2].

The last few years, the impact of mercury on the cardiovascular system, especially hypertension has become a concern. Hypertension has been proved as a major risk factor for cardiovascular disease triggers. The incidence of hypertension has increased for the last three decades. Besides food consumption which high salt intake and obesity, exposure to mercury in the environment also one important factor driving the incidence of hypertension. Epidemiological and experimental studies showed association between mercury exposure and increased blood pressure. Chronic mercury exposure levels in humans can be determined by examining the hair biomarker are considered most suitable for chronic exposure, easy to collected, and non-invasive[9]. Several studies in the world showed an association between mercury exposure to increased blood pressure among the gold miners who use mercury were found significant increased sistolee blood pressure ($P < 0.01$) correlated with lipid peroxidation and oxidative stress ($P < 0.01$)[10]. A case-control study showed the incidence of gold miners who have hypertension 46% greater than the control group. Other studies showed that a significant correlation between hair mercury levels with hypertension[11].A study of 251 people in the Brazilian Amazon showed that blood pressure was associated with higher levels of total mercury in the hair where an increased in blood pressure sistolee along with the increased amount of mercury in the hair of <10 lg/g[12]. In Indonesia research about association between hair mercury exposure with hypertension is still not received attention by researchers.

This research aims to determine the levels of hair mercury, blood pressure as well as individual factor characteristics (age, sex, and smoking habits) and determine the association between hair mercury with hypertension in communities around ASGM Cimanggu, Pandeglang, Banten Province. Cimanggu was an area of the ASGM who around a residential area that still used mercury to gold processing and has operated for approximately eight years. Balai Besar Teknik Kesehatan Lingkungandan Pengendalian Penyakit (BBTKLPP) Jakarta in 2017 had found mercury in wastewater in the processing of gold and mercury hair on people living around ASGM above the predetermined quality standards[13]. If it continuously happened could have a negative impact on human health one of hypertension disorders due to exposure to mercury.

Material and Method

This study was conducted using a quantitative method with cross-sectional study design and use secondary data derived from datasheet "Analysist of Potential Impact of Risk Factors Environment Based for Disease Outbreaks on Interest Mining Society" conducted by BBTKLPP Jakarta. This research will describe mercury levels in the hair and it's association with hypertension in community living around ASGM, Cimanggu, Pandeglang, Banten.

The population in this study was communities who live around ASGM in Cimanggu with total of 5442 people, the samples in this study were communities who selected based on inclusion criteria among men or women have equal opportunity to participate, length of stay ≥1 year around ASGM, in good health and willing to become respondents signed an informed consent. Calculation of sample size using the formula Lemeshow sought, in order to obtain a maximum sample is 100 sample. Sampling was conducted using quota sampling.

This study will use Univariate analysist to describe Hair mercury level, blood pressure, and individual characterictics respondents, and bivariate analysist used a chi square test to show association between hair mercury with hypertension. Hair mercury analyzed in the laboratory BBTKLPP Jakarta using Mercury Analyzer (MA) 3000 with cold pavor method and blood pressure were measured directly two times using sphygmomanometer merk ABN and individual characteristics taken through a questionnaire.

Findings: Based on Table 1 showed that of the 100 respondents who checked his blood pressure, only 29% who have hypertension, that was systolic≥140 or diastolic pressure ≥90[14]. Respondents who had hair mercury levels above the quality standards that have been established by UNEP (2 ppm) is 55%. Individual

characteristics show that respondents >40 years old only 46%, which was man 22%, and smokers only 23%.

Table 1. Distribution of Hair Mercury, Hypertension, and Individual Characteristics Around ASGM in Cimanggu 2018

Variables	Total	Presentation (%)
Hypertension		
No (<140/90)	71	71
Yes (≥140/90)	29	29
Hair Mercury Levels		
Normal (≤ 2ppm)	45	45
Abnormally (> 2ppm)	55	55
Age		
≤ 40 years	54	54
> 40 years	46	46
Gender		
Woman	78	78
Man	22	22
Smoking Status		
Do Not Smoke	77	77
Smoking	23	23

The association showed There is no association between hair mercury levels and hypertension (P value = 1, OR= 1.01, CI 95% = 0.42-2.40). OR = 1.01 that means respondents with abnormally hair mercury level have equal odds to have hypertension with normally hair mercury with 95% confidence interval hair mercury respondents between 0.42-2.40 ppm. Mercury exposure in society was measured using hair as a biomarker because can explain mercury levels long term in the body, hair mercury also quite persistent even not lost when washing with shampoo and coloring, and hair mercury levels 250 times in blood[15]. Hair will be examined using Mercury Analyzer (MA) 3000 and cold vapor method with the results of measuring parts per million (ppm) with quality standards set by UNEP (2 ppm)[16].

The analysis showed most of the respondents have hair mercury level abnormally. Abnormally hair mercury level in ASGM communities related to their exposure to mercury from combustion processes and the separation of gold which exposes humans through intermediary of water, air, and land for a long time, in additionally the hair shaft grows to combine mercury from the blood[17]. This result same with previous studies conducted around ASGM in Krueng Sabee, Aceh, 90.28% of respondents contains mercury levels above the quality standard value 10 μg/g set by the WHO. Fillion found 67.9% of the population living around the Amazon River containing hair mercury levels ≥ 10 mg/g[12].

Hypertension was defined as increasing systolic blood pressure or diastolic after at least 2 times measurement. Hypertension in this study defined as blood pressure that had systole pressure of 140 mmHg or diastolic pressure of 90 mmHg[14].This study showed just a few respondents with hypertension. This result was lower than research conducted by Valera et al. that showed 53.9% of people living around the mining have hypertension[18]. And about 46% of miners in Europe have hypertension[10]. Many factors can lead to hypertension such as age, sex, smoking, obesity, lack of exercise, excessive salt consumption, and stress[19]. And from this research, we can show that most of the respondent had a low risk of hypertension, because most of the respondents were woman, ≤ 40 years and do not smoke.

In this study showed no significant association between hair mercury levels and hypertension with OR = 2.072. It's not in line with Bautista et al. where people with high levels of hair mercury was four times more at risk for hypertension (p value= 0.02)[17]. The same results also proved by Fillion et al. and Valera who reported a positive association between mercury levels and hypertension[12,20]. In recent years there had increased attention to mercury effects on cardiovascular system like atherosclerosis, cardiac arithema, and renal dysfunction[21,22]. The mechanism of mercury affecting blood pressure cannot be explained with certainty, but the accumulation of mercury can affect endothelial function by inhibiting NO synthesis[23]and increasing oxidative stress, lipid peroxidation, and TNFα and interculin[17,24,25]. Increased oxidative stress from lipid peroxidation and decrease in antioxidants can trigger endothelial and renal dysfunction, which can increase the risk of hypertension and atherosclerosis, and result increase in blood pressure and pulse[22,23,25].

The same result with this study showed by Rajaee who cannot found association between mercury levels with blood pressure around communities ASGM[26]. The lack of association between hair mercury levels with hypertension because there had many factors causing hypertension behind mercury contaminants such as age, smoking, obesity, alcohol consumption, high natrium consumption, and low physical activities[27]. Besides that small sample size and low hair mercury levels can effect significance result study. Therefore need further

verification by using a larger sample with high intensity process mercury use. Although statistically there's no association between hair mercury and blood pressure, mercury exposure continuously for a long time can had a negative impact on health, one of them is hypertension, so monitoring of mercury use in ASGM areas should be monitored and conducted routine health monitoring in the community around ASGM.

Conclusion

The study concluded that most of (55%) respondent had abnormally hair mercury level, but only 29% had hypertension with the characteristics age >40 years old 46%, man 22%, and smoking 23%. There's no significant association between hair mercury and hypertension (p value = 1) with OR = 1.01 means respondents with abnormally hair mercury level have equal odds to have hypertension with normally hair mercury.

Conflict of Interest: The authors declare they have no conflict of interest.

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Ethical Clearance: The research protocol was approved by the research and community engagement, the ethical committee of public health faculty of the Universitas Indonesia with number of ethics 95/ UN.2.F10/PPM.00.02/2019.

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Effect of Lavender Oil Massage on Pain among Patients with Knee Osteoarthritis

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Abstract

Osteoarthritis (OA) is a progressive chronic joint disease with global relevance with up to 250 million people being affected from knee OA worldwide. The aim of this study was to evaluate the effect of Lavender oil massage on pain among patients with knee osteoarthritis. A convenient sample of 60 adult male and female patients who admitted to Rheumatology and Rehabilitation unit affiliated to Cairo University hospital in Egypt with confirmed diagnosis of knee OA divided into experimental (study) and control group. A quasi-experimental Time Series pre-post test non equivilant interrupted control design was utilized in the current study. Data was collected using Personal and Medical Background Information Form, Pain Numerical Rating Scaleand Lequesne Algo Functional Index of Severity. The study findings revealed that there were significant statistical differences of pain intensity score and OA severity between study and control group after application of lavender oil massage.

Conclusion: Lavender oil massage was proved in this study to be effective on pain and OA severity among patients with knee osteoarthritis.

Keywords: *Lavender oil massage, pain, Patients with osteoarthritis.*

Introduction

Osteoarthritis is one of the most common musculoskeletal diseases, with an estimated prevalence of 12% to 22% worldwide[1]. In Egypt OA is the third leading cause of disability just after heart disease and back disorder; 1.6 million people were affected by OA in Egypt[2]. According to the American College of Rheumatology, OA is defined as a group of conditions which are associated with the defective integrity of articular cartilage result in changes in the underlying bone and articular margins[3].

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Knee OA is divided into two types either idiopathic (primary) or secondary (post-traumatic). The primary OA is a gene-dependent disease, while secondary OA occurs after a traumatic event. Clinical characteristic of knee OA include pain, swelling,stiffness, crepitationand loss of movement that results in functional limitation, physical disability and reduced health-related quality of life[3].

Aromatherapy is one of complementary and alternative therapy (CAT) uses essential oils and herbal essences for improving mental health or relieving physical symptoms. Previous studies have examined the effect of aromatherapy on anxiety, pain and wound healing[4]. As result of its simplicity and affordability, aromatherapy has been used as an optional choice in some medical settings, either alone or together with standard pain control protocol[5].

Nursing practices for patient with osteoarthritis should be focused on performing regular follow up,

training, and determining the most effective symptom management method. Aromatherapy and massage are among the non□pharmacological method which nurses may directly and independently use to control pain so they should increase their knowledge and skills regarding aromatherapy massage like recognizing the pharmacological actions of the essential oils and how to apply aromatherapy massage properly[6].

Method

Aim of the Study: The aim of the current study was to evaluate the effect of Lavender oil massage on pain among patients with knee osteoarthritis. To fulfill the aim of this study the following research hypotheses were tested:

H1. Total mean score of pain of OA patients who receive lavender oil massage will be different from total mean score of pain of OA patients who receive routine protocol of care.

H2: The severity of osteoarthritis in OA patients who receivelavender oil massage will be different from the severity of osteoarthritis in OA patients who receive routine protocol of care.

Research Design: Quasi-experimental time series pre-post test nonequivilant interrupted control design was utilized in the current study.

Sample: A convenient sample of adult male and female patients with confirmed diagnosis of OA of the knee, their age ranged between 18 and 50 years. All patients admitted to rheumatology unit and met the inclusion criteria throughout 6 months from July 2018 to January 2019 were allocated to either study or control group starting with control group.

Setting: The current study was conducted in a selected Rheumatology and Rehabilitation unit, at Cairo university hospital, Egypt.

Data Collection Tools:

1. Personal and Medical Background Information Form (PMBIF): It is consisted of two parts: (a) Personal data sheet (b)Medical data sheet related to disease onset, duration, medical treatment, etc.
2. The pain Numerical Rating Scale (NRS): It is an 11-point scale (0-10). Pain intensity can be classified into mild, moderate, and severe levels based on the NRS score.
3. Lequesne Algo Functional Index of Severity: it is a disease questionnaire related to severity of OA. It consists of three scales with eleven items. Its scoring system 0= none, 1-4 mild, 5-7 moderate, 8-10 severe, 11-13 very severe and >= 14 extremely severe

Validity & Reliability: Tools were validated by a panel of five experts in the field of Medical-Surgical Nursing and modifications were carried out. Reliability was tested using Cronbach's alpha with value of 0.98.

Procedure: Patients were randomly divided into study and control group. Participants in the study group were instructed to massage their affected knee joint for 20 min 3 times per week for 3 weeks using 5 ml lavender essential oil diluted in sweet almond oil at a concentration of 3% and continued to receive conventional drugs. While the participants in the control group receive similar conventional drugs described by the rheumatologist.

Results

Section I: Demographic characteristics and medical data of the study and control groups.

The age of 60% of the study group and 56.6% of the control group ranged from41-60 years old and the mean age was 41.83 ± 6.828. Female gender constituted 83.3% of both study and control group.86.7% and 93.4% of study and control group respectively were married. Less than half of study group (40%) and around one third of control group can read and write,66.6% in both groups were housewives and 73.3% were rural areas' inhabitants.

According to medical data, around two thirds and 63% of study and control group respectively had gradual onset of osteoarthritis. 73% and 77% of study and control group respectively had no chronic diseases. 60% and 43% of study and control group respectively had no family history of osteoarthritis.

Section 2: Delineates hypothesis testing for being supported or not among study and control groups.

Table (1): Comparison between pain intensity score at four time points of both study and control group (N=60).

Pain Intensity		Study Group		Control Group		X^2	P value
		No.	%	No.	%		
Base Line	Mild	1	(3.3)	0	(0)	1.355	0.508
	Moderate	5	(16.7)	7	(23.3)		
	Severe	24	(80)	23	(76.7)		
First Week	Mild	5	(16.7)	2	(6.7)	5.540	0.063
	Moderate	13	(43.3)	7	(23.3)		
	Severe	12	(40)	21	(70)		
Second Week	Mild	11	(36.7)	3	(10)	7.251	*0.027
	Moderate	8	(26.6)	7	(23.3)		
	Severe	11	(36.7)	20	(66.7)		
Third Week	Mild	13	(43.3)	3	(10)	9.583	*0.008
	Moderate	7	(23.4)	7	(23.4)		
	Severe	10	(33.3)	20	(66.6)		

*significant at P≤ 0.05.

Table (1) denotes that there was significant statistical difference between study and control group along study period.

Table (2): Comparison between levels of algofunctional index score at four time points of both study and control group (N=60).

Disease Severity		Study Group		Control Group		X^2	P value
		No.	%	No	%		
Base line	Severe	5	(16.7)	3	(10)	.605	0.739
	Very severe	7	(23.3)	7	(23.3)		
	Extremely severe	18	(60)	20	(66.7)		
First week	Mild	1	(3.3)	0	(0)	8.865	0.065
	Moderate	4	(13.3)	0	(0)		
	Severe	11	(36.7)	7	(23.3)		
	Very severe	7	(23.4)	8	(26.7)		
	Extremely severe	7	(23.3)	15	(50)		
Second week	mild	4	(13.3)	0	(0)	11.910	*0.018
	Moderate	4	(13.3)	0	(0)		
	Severe	10	(33.4)	9	(30)		
	very severe	6	(20)	6	(20)		
	extremely severe	6	(20)	15	(50)		
Third week	mild	5	(16.7)	0	(0)	13.001	*0.011
	Moderate	4	(13.3)	0	(0)		
	Severe	10	(33.3)	9	(30)		
	very severe	5	(16.7)	6	(20)		
	extremely severe	6	(20)	15	(50)		

*significant at P ≤ 0.05.

Table (2) clarifies that there was significant statistical difference between study and control group along study period.

Figure 1: shows that there was statistical significant difference in pain score among study and control group (ANOVA test: 46.229, p-value: *0.000) respectively along the study period. Alsothere was a statistical significant difference in pain score between study group when compared to control group in the 1st, 2nd, and 3rd weeks of intervention.

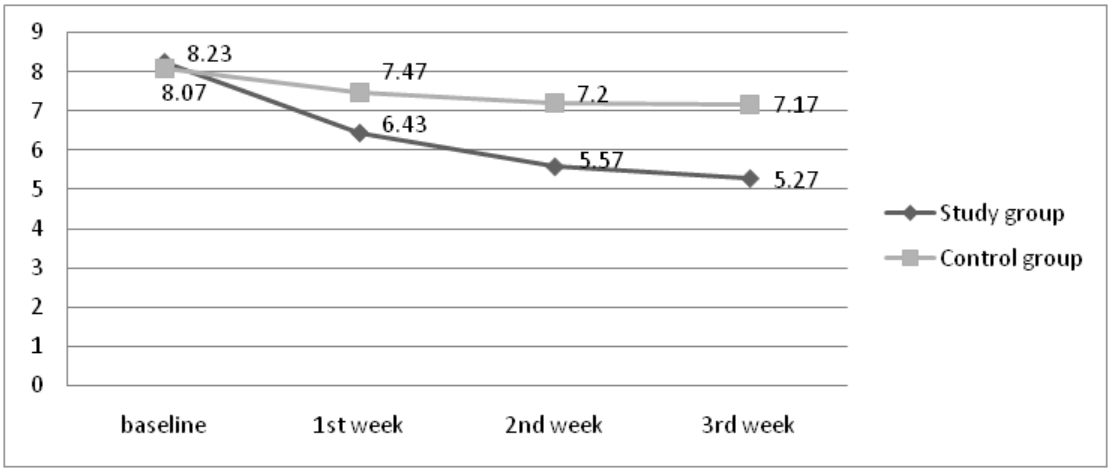

Figure 1: Differences of pain score between study & control group at four time points.

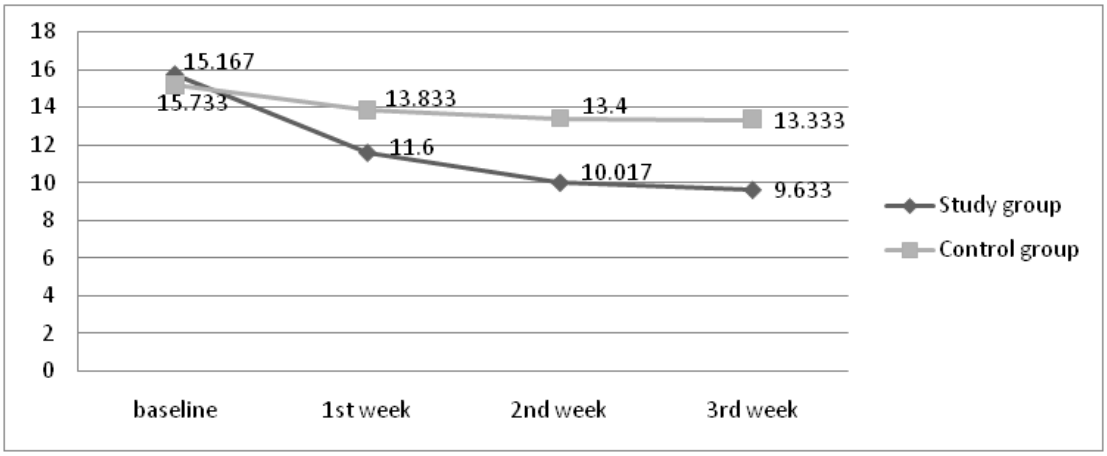

Figure 2: Differences of algofunctional index score between study & control group at four time points.

Figure 2: clarifies that there was statistical significant difference algofunctional index score among study and control group (ANOVA test: 52.260, p-value: *0.000) along the study period.Alsothere was a statistical significant differencein algofunctional index score between study group when compared to control group in the 1st, 2nd, and 3rd weeks of intervention.

Discussion

The current study revealed that, the majority of the study participants aged between 41-60 years old with mean and standard deviation of age 41.83 ± 6.828. This finding is almost consistent with Arslan, Kutlutürkan and Korkmaz, (2019)[7],the majority of their study participants were 35-64 years old. The findings can be explained with the fact that OA development starts much earlier than originally thought, and ranked among the top 20 diseases in the 40–45 years age group.

Regarding gender, more than half of the participants were females. This finding is congruent with the findings of the studies by Nasiri and Mahmodi, (2018); Arslan, Kutlutürkan and Korkmaz (2019) & Pehlivan and Karadakovan, (2019)[8,7,6] all affirmed that the

majority of their study participants were females. In addition, Mahajan and Patni, (2018)[9] confirmed that OA strikes women more often than men and it increases in prevalence, incidence and severity after menopause. The majority of study participants were housewives. These findings were relatively congruent with Nasiriand Mahmodi, (2018); [8]. The finding that the majority of the participants were housewives could be explained that the majority are females and reside from rural areas.

More than two thirds of study participants had gradual onset of disease. This could be explained with that OA develops slowly and that's why it takes time to induce symptoms that appears gradually starting with pain which worsens overtime. The majority of study participants had no comorbidities as diabetes and hypertension. In contrast Swain et al., (2019)[10] reported that 67% of patients with OA had at least one other chronic condition, being 20% higher than those without OA. In addition, Hawker et al., (2017)[11] mentioned that 77% of their study sample had hypertension, added that OA-related difficulty walking was a significant and potentially modifiable risk factor for diabetes complications.The mean age of the current study participants was 41.83 ± 6.828 years old that could be the reason why the majority of study participants had no co morbidities as the prevalence of co morbidities increases with advancing age.

The findings of the present study revealed that a significant reduction in the mean score of pain 5.27 ±2.083 and OA severity 9.633±5.0085 after application of lavender oil massage on knee joint compared to the control group 7.17±1.802 and 13.333±3.4996 respectively. This finding supports the effectiveness of lavender oil massage on pain and OA severity among patients with osteoarthritis. The findings of the present study are consistent with other study conducted by Nasiri & Mahmodi, (2018); Nasiri et al., (2016)[8, 12]. The findings showed that pain severity reduced significantly in the group undergoing massage with lavender oil compared to control group. This finding could be explained in the light of fact that the direct pharmacological effects of lavender oil is possibly because of lynalyl acetate and linalool, which can effectively decrease pain and inflammation, prevent muscle spasms and reduce tensions, leading to improve pain and physical function.

In this respect, other study conducted by Seda Pehlivan (2018)[6], reported that there were significant differences in pain score in the aromatherapy group when compared with the massage and control group. Other study done by Arslan et al.'s (2019)[7]revealed that aromatherapy massage performed in patients with osteoarthritis had positive effect to reduce knee pain scores, morning stiffness, and improve physical functioning status and considered that complementary treatment modalities are useful for nurses who can perform aromatherapy massage for symptom management in OA.

In the current study, there was a statistical significant difference in mean score of pain between study group when compared to control group in the 1st, 2nd, and 3rd weeks of intervention. This findings is consistent with Nasiri and Mahmodi, (2018); Nasiri et al., (2016);[8, 12]who reported that pain severity differed significantly immediately, 1 week, and 4 weeks after the intervention with p value (<0.001) compared with placebo and control groups.

On the same stream, another study finding belongs to Zhang et al., (2018)[13] revealed that patients with bilateral knee OA has been demonstrated that lavender oil aromatherapy massage, significantly reduced the patients' knee pain, tenderness, and morning stiffness. Furthermore, other study conducted by Won andChae, (2011)[14], reported that aromatherapy massage could be recommended as an effective intervention to decrease pain and to increase stride length in the elderly with knee osteoarthritis. Atkins and Eichler (2013)[15]added aromatic massage therapy was more beneficial than massage alone among knee OA patients.

Conclusion:Lavender oil massage was proved in this study to be effective on pain among patients with knee osteoarthritis.Implications:The complementary therapy is useful to healthcare providers who can learn, apply, or recommend aromatherapy massage techniques as a component of care for symptoms management of OA patients.

Recommendations:

- Replication of the study using a larger probability sample selected from different geographical areas in Egypt.
- Longitudinal study should be designed to determine the long term effect of lavender oil massage for this group of patients over a long period of time.

Ethical Clearance: A research approval was obtained from the Research and Ethical committee

at Faculty of Nursing - Cairo University and official permission was obtained from the administrators at study setting. Written informed consent was obtained from each patient.

Conflict of Interest: The authors declare that there is no conflict of interest.

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How Soon Can You Expect to Get Pregnant after Discontinuing Reversible Contraceptive Method? A Survival Analysis of the 2017 Indonesia Demographic and Health Survey Data

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Abstract

Objectives: The information about the return of fertility was important for women use contraceptives for delaying and spacing. The objective of this study was to analyze time to pregnancy following contraceptive discontinuation among reproductive women in Indonesia.

Material and Method: Data on the return of fertility after discontinuation of various reversible contraceptive method were collected through a calendar contraceptive history among currently married women taking part in the Indonesia Demographic and Health Survey (IDHS) 2017. There were 3,887 women who discontinued using injectables, 1,641 women who discontinued using oral contraceptives, 228 women who removed their IUDs and 233 women who removed their implants for planning a pregnancy, who were followed up in this study to assess the return of fertility after discontinuation of their respective reversible contraceptives.

Findings: This study found that there is a delay in conception or pregnancy following discontinuation of a reversible contraceptive, but there is no permanent infertility among women after discontinuation of reversible contraceptives. The cumulative pregnancy rate for a-year is 75% for discontinuers of oral contraceptive users, 72% for discontinuers of IUD users, 75% discontinuers of implant users and 64% for discontinuers of injectable users.

Conclusions: The study found that contraceptive method significantly influenced the length time to become pregnant after discontinuation of reversible contraceptive method. However, the duration of contraceptive use has no relationship to time to pregnancy. To conclude, there is no impaired fertility after contraceptive discontinuation. Implication of this study is important for counseling process.

Keywords: *Reversible contraceptives, pregnancy rates, discontinuation.*

Introduction

The success of the family planning program in Indonesia is shown by the rapid decline in the country's fertility. Indonesia's Total Fertility Rate (TFR) dropped by more than half in approximately 50 years from 5.61 children per woman in 1971 to 2.4 children per woman in 2017[1]. In Indonesia, injectables and oral contraceptives are the most commonly used form of modern contraceptive method followed by IUDs and implants. Women who used contraceptive for delaying and spacing pregnancy must consider not only the safety and effectiveness of the chosen contraceptive method for the duration of their use, but also for the reversibility of the method in order to become pregnant after their discontinuation. Method other than sterilization (vasectomy and tubectomy), do not bring about an irreversible change in fertility[2] Therefore, the ideal contraceptive method for spacing is that which can reverse fertility as soon as possible after the method has been discontinued[3].

More than a quarter of all women of reproductive age had discontinued the use of contraceptives[1]. Over

two-thirds of these women had discontinued for reasons other than wanting to have a child, and it can be assumed that none of them had information about precisely when they would become fecund again and have a child. Thus, a considerable proportion of childbearing women would be exposed to the risk of having unplanned or unwanted pregnancies and they would potentially put themselves at the risk of their consequences. Yet, not much is known in Indonesia about when these women would be likely to return to fertile status. It is essential to provide these women with information not only about method of contraceptive and their side effects, but also about information regarding the return of fertility after discontinuation. The objective of this study was to analyze time to pregnancy following contraceptive discontinuation among reproductive women in Indonesia.

Material and Method

This study is a secondary data analysis of the 2017 Indonesia Demographic and Health Survey (IDHS). The contraceptive calendar data of the Women's Questionnaire form the source of data for the present study. The calendar data record the information on history of contraceptive use, history of pregnancy, and other information related to the survey respondents from January 2012 to the date of the interview in 2017. This survey only provides monthly data of reproductive and contraceptive patterns. The data on the date of the last menstrual period are not collected. Therefore, the time of return of fertility (in number of months) is calculated from the month that women stopped using reversible contraceptive method in order to plan a pregnancy, up until the month that women became pregnant and had either a live-born or still-born child.

Survival analysis will form almost all of the multivariate data analyses. With respect to each method, the dependent variable is the time of needed for return of fertility, or the delay in conception. The dependent variable is considered in two ways: In the first case, the dependent variable is *censored* (survival code = 0) if the terminal event has not occurred (i.e., there is no pregnancy from the time of contraceptive discontinuation until the survey date). In the second case, the dependent variable is *uncensored* (survival code = 1) if the terminal event has occurred (i.e., there is a pregnancy from the time of contraceptive discontinuation until the survey date).

The suitable methodology for the analysis of return of fertility which contains *censored* samples is defined as the *life table*. The Kaplan Meier life table method is used to examine the return of fertility and the median time to first ovulation after contraception was stopped. Furthermore, this analysis also utilizes the Cox regression method to estimate the survival experience based on the proportional of hazard model. All analyses are adjusted using the complex survey design. The entire analyses of this study will use a two-tailed p-value. Only the probability values at level of $p \leq 0.05$ are considered significant to the model.

Findings: Based on the IDHS 2017 data set, there are about 5,989 episodes of women having planned a pregnancy following their contraceptive discontinuation. These episodes are divided to 3,887 episodes of women who discontinued using injectables, 1,641 episodes of women who discontinued using oral contraceptives, 228 episodes of women who removed their IUDs and 233 episodes of women who removed their implants for planning a pregnancy.

Of the 5,989 women who had discontinued the reversible contraception in order to become pregnant, almost 60% were aged 25-34 years and 29% of respondents were aged 35-49 years. There were 49% women used contraception for 2 years, 38% women used contraception for 2-4 years and only about 13% used contraception for 4 years or above. More than three-quarters of women in this study were not smoking (neither active smoking nor passive smoking). About a-half of respondents were not working. Most of the women who discontinued reversible contraceptives lived in Java Bali islands and had sexual intercourse for less than twice a week. The data indicates that women who discontinued IUDs and implants for a planned pregnancy are totally parous with at least one child, but women who discontinued injectables and oral contraceptives are both parous and nulliparous.

Considering women of all characteristics the data show that the pregnancy rates after six months of the discontinuation of contraceptives were 59.3% for the use of oral contraceptive, 59.1% for the use of implants, 42.9 for the use of injectables, and 59.6% for the use of IUDs. The cumulative pregnancy rates after a-year of contraceptive discontinuation were 75.4%, 71.5%, 64.2% and 74.9% for women who stopping oral contraceptives, implants, injectables and IUDs respectively (Figure 1).

A cox regression analysis adjusted with complex sample design was performed to estimate some determinants on pregnancy after contraceptive

discontinuation among women in Indonesia. The data shows that the probability to conceive significantly influenced by the types of contraceptive method. In this study, it can be known that IUDs and oral contraceptives have faster time of return to pregnancy, compared to implants and injectables. However, the pregnancy rated after 2-years of discontinuation among four contraceptive method were nearly similar. In this study, the duration of contraceptive use has no influence on the probability to become pregnant following contraceptive discontinuation. Hence, women do not need to be fear to use contraceptive in a long duration because it doesn't impact on the future fertility.

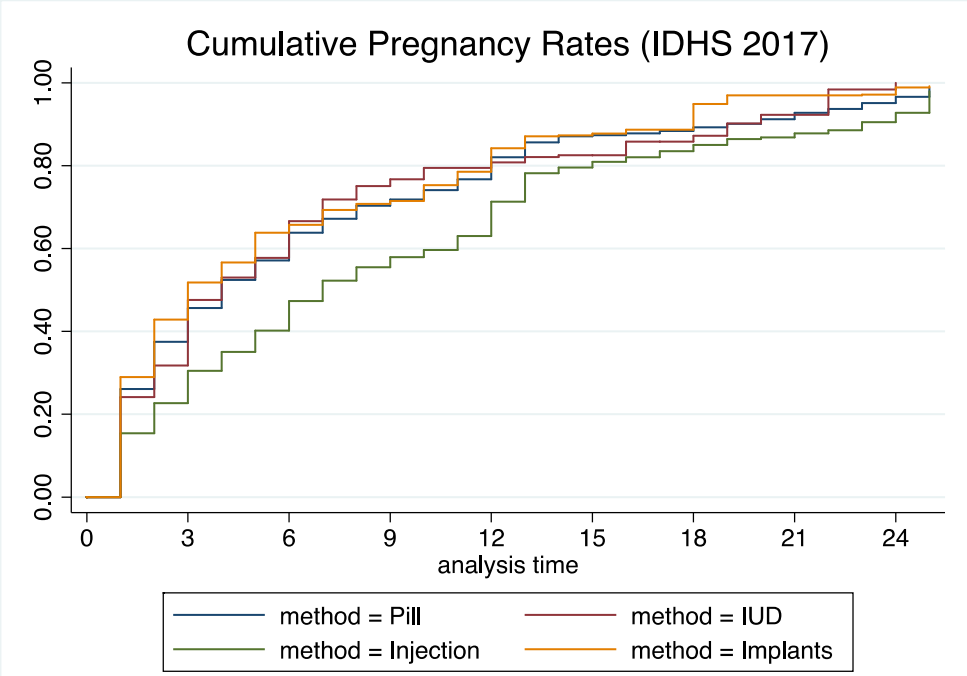

Figure 1. Cumulative Pregnancy Rates

Discussion

This study examined the type and duration of reversible contraceptives used by women in reproductive age. Some factors such as demographic factors and socio-economic factors were used as controlled variables in influencing the time of return to fertility after reversible contraceptive discontinuation. The results showed that oral contraceptive and injectables were the most popular contraceptive method in Indonesia compared to IUDs and implants. About 92% of episodes of contraceptive discontinuation in this study were for injectable and oral contraceptive users. The low uptake of Long-Acting Reversible Contraceptives (LARC) was consistent to the result of Indonesia Demographic and Health Survey[1]. Therefore, improving family planning services to increase the use of long-acting method is still needed to reduce the risk of drop out and unintended pregnancy as consistent to the Government of Indonesia's Medium-Term Development Plan 2015-2019.

The fear of side effect especially related to fertility resumption following contraceptive discontinuation such as infertility have made many women do not use any modern contraception[4–7]. Therefore, comprehensive counselling for every woman is crucial.

Cumulative pregnancy rates for implants did not differ from oral contraceptives and injectables. Another study explains that implants are known to release low doses of progestogen that can clear rapidly from women's circulation followed by the resumption of regular menses and ovulatory[8].

The longest delay to become pregnant is experienced by women who discontinued injectables. Women's

fertility will be returned soon after discontinuation of contraceptive method with the exception of progestogen only injectables – Depot medroxyprogesterone (DMPA) or Norethisterone enantate (NTE-EN)[9]. Furthermore, the length delay to conception following injectables discontinuation is not influenced by the duration of injectable use[10].

However, women's age has an impact on the return of fertility itself. This is because fertility has a strong association with women's age which means that the older women have a reduced ability to conceive naturally[11–13]followed by subsequent stages of overt cycle irregularity. The gradual decline in the size of the antral follicle cohort is best represented by decreasing levels of anti-Mullerian hormone. The variability of ovarian ageing among women is evident from the large variation in age at menopause. The identification of women who have severely decreased ovarian reserve for their age is clinically relevant. Ovarian reserve tests have appeared to be fairly accurate in predicting response to ovarian stimulation in the assisted reproductive technology (ART. It also could be happened in older women who were not succeed to become pregnant after contraceptive discontinuation because they entered the perimenopause or menopause period[8].

The study has concluded that there is no impaired fertility among Indonesian women following discontinuation of reversible contraceptive use (injectables, oral contraceptives, IUDs and implants). Based on this result, there needs to be a policy to inform men and women of reproductive age (and also adolescents) that there is no fear of impairment of fertility from using reversible contraceptives and that fertility returns after discontinuation of these contraceptives, albeit after a delay depending on the type of reversible contraceptive used. This would allay any worry that women (and their partners) may have about the loss of fertility by using reversible contraceptives. This policy needs to supplemented by a policy of increased promotion of reversible contraceptives among reproductive age couples to meet their needs of contraception for spacing pregnancies and also to reduce the probability of unwanted pregnancies. Information about return of fertility is also crucial for ensuring informed choice about contraceptives and for the assessment of the quality of care of reversible modern contraceptive method.

The findings of this study also lead to the need for formulating a policy to strengthen effective counseling to determine appropriate contraception selection and discontinuation. The results of this study should be important as information for the preparation of material for counselling for family planning users. The information about the return of fertility should be conveyed to the couples to clear their misperceptions about the inability to become pregnant after discontinuation of use reversible contraceptive method. Married women who want to choose their contraceptive method should have counselling by the health care providers. This counselling process is important to help women to use the best contraceptive method that suits their family size goals.

Conclusion

In conclusion, there is no impaired fertility after contraceptive discontinuation. The study found that contraceptive method significantly influenced the length time to become pregnant after discontinuation of reversible contraceptive method. The impact of duration of contraceptive use has no significant relationship to the time to pregnancy following contraceptive discontinuation. Implication of this study is important for counseling process.

Conflict of Interests: The author has no conflicts of interest associated with the material presented in this paper

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Ethical approval and consent to participate: Data of the 2017 Indonesia Demographic and Health Survey did not attach any personal identity. However, the authors had received ethical approval from the Ethical Committee the Faculty of Public Health University of Indonesia, number 652/UN2.F10/PPM.00.02/2018. Permission to use IDHS data was obtained from The Demographic and Health Survey (DHS) Program.

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Reviving the Lost Extremity: A Case Report

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Abstract

The hand in the human body plays a major role in daily life, communication, social contact and basic functions such as grasping. Finger and partial finger amputations are the most frequently found forms of hand loss and trauma which lead to an impact on the psychological health, functional abilities and aesthetics of an individual. A prosthesis with good fitting, comfort and aesthetics can make the patient feel capable and whole again. This article describes a technique for fabrication of a custom made glove type finger prosthesis using silicone elastomers along with a ring for providing more retention to the prosthesis. Shade matching has been achieved by using intrinsic acrylic paints. This case report paper describes a technique to prosthetic rehabilitation of an amputated finger by fabrication of custom finger prosthesis by using silicone elastomer, which is aesthetically acceptable, comfortable to use and is cost effective with a simple approach.

Keywords: *Silicone elastomer, finger prosthesis, color matching, retention.*

Introduction

It is rightly said "Grief is in two parts, the first is loss, and the second is the remaking of life." The loss of a limb or a digit has an immense impact on one's mind, it can manifest as anxiety, depression or post-traumatic stress disorder on an individual.[1]Replacement of the missing finger by fabrication of an artificial finger is a very challenging process and technique sensitive procedure in the terms of artistic abilities and skill expertise. Prosthesis made for patients should be comfortable to wear, durable, light weight, aesthetically pleasing and easy to put on and remove.

Case Report: A 60 year old male patient reported to the Department of Prosthodontics Crown and Bridge, Maharishi Markendeshwar College of Dental Sciences and Research, Mullana, Ambala, for the fabrication of Complete Denture. On general examination, it was noticed that the patient had lost part of his left index finger (distal phalange) about 5 years back, due a traumatic injury. On physical examination a solitary healed scar was seen on palmar surface of the amputated finger. The surrounding surface and area of the finger appeared to be normal with no signs of pain, infection or any inflammation. Informed consent was made with a detailed explanation of the procedure. [Figure 1].

Figure 1: Amputated left index finger

Technique:

1. Patient was requested to keep his hand in normal resting position and not stretched. Lubrication with a

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uniform thin layer of petroleum jelly is done, which prevents the adhering of the hydrocolloid to the skin on the site of the impression surface. A cardboard box was selected larger in size than the patient's hand. One side of the cardboard box was cut open to place and remove the hand.[2] A thin uniform mix of hydrocolloid (*Zhermack*) was poured inside the box creating the base of the impression on which the patient was instructed to place the palmar aspect of the hand over of the impression material, simultaneously the dorsal surface of the whole hand was covered.[3] In the end, a layer of dental plaster (*Kalabhai Kaldent)* was poured over the impression material for imparting strength to the impression made as well as to prevent its tearing on removal of the patients hand. [Figure 2]

Figure 2: Alginate Impression and Impression surface

2. The impression made was poured with dental stone (*Kalabhai Kalstone)* with vigorous tapping ensuring the complete flow of the dental stone. A positive replica of the site was obtained and finished.[2] [Figure 3].

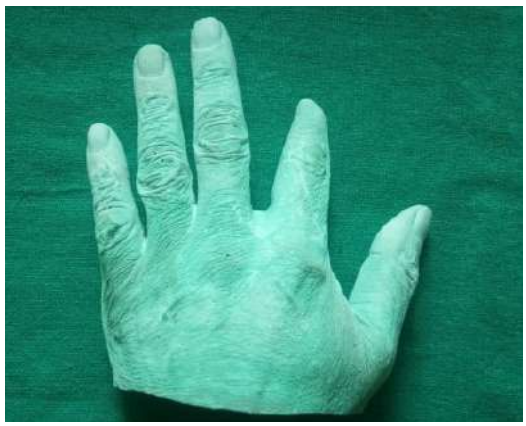

Figure 3: Dental stone model

3. In this case, the wax pattern was fabricated by Donor Finger which involved making a hydrocolloid impression of the donor index finger. The donor finger should be of the same side of the patient's amputated finger and same sex. The donor was selected by matching the appearance and size of the fingers using the model obtained. The impression made was poured with heated liquid modelling wax (MAARC).[4] The wax pattern is carefully sculpted hollow from the inside followed by finishing and carving to give it a natural appearance. [Figure 4]

4. The custom made glove type wax pattern prosthesis is tried on the patient's amputated index finger. Proper fit and length is established with verification of the correct orientation. [Figure 4].

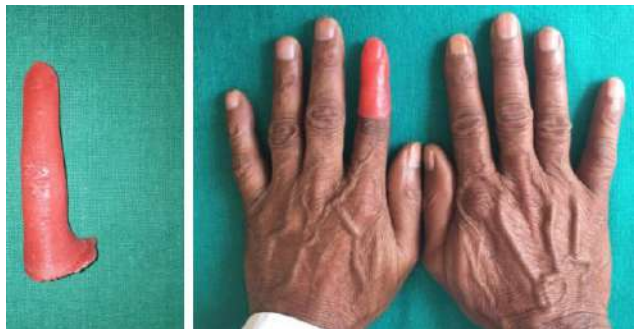

Figure 4: Trial of wax pattern on amputated finger

5. The wax pattern was invested. After complete set, de-waxing is carried out. A mould is obtained.[5]

6. Silicone (RTV Silicone, MP Sai Enterprises, Mumbai) was used along with acrylic paints (KURTZY Acrylic color paintv12 shades) as intrinsic shades. The colors Red, Blue, Yellow, Black, were used to create the natural skin tone of the patients hand, mixing was carried out on a glass slab. Color matching was done in natural light.[6] After desired shade was achieved and the silicone material was packed into the mould, bench pressed and was left overnight for processing. [Figure 5].

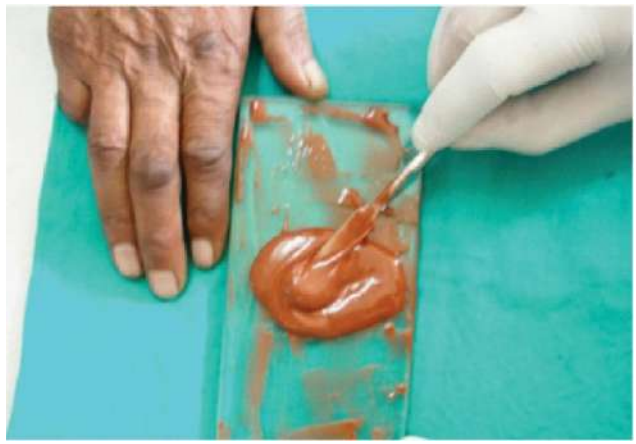

Figure 5: Shade Matching

7. A prefabricated artificial nail was used (Electromania Acrylonitrile Butadone Styrene Style Plane Nail Tips Pack of 24).
8. The final prosthesis was retrieved, excess was trimmed and finished. The artificial nail was trimmed and glued according to esthetics, followed by insertion of the final prosthesis on the patient's amputated left index finger.A ring was placed over the silicone finger prosthesis, which provided more retention to it. The prosthesis was delivered to the patient, was completely satisfied and contented with the outcome.[4]
9. To maintain its hygiene, the prosthesis should be washed with antibacterial soap from inside and outside air dried and then worn.[7] Exposure to high temperatures should be avoided. Smoking may discolour and stain the prosthesis. The prosthesis is not to be worn overnight as it will lead to irritation of the underlying skin. [Figure 6]

Figure 6: Silicone Finger Prosthesis

Discussion

It has been reported that the most common found amputations are partial hand amputations, presenting with loss of one more fingers. They are commonly resulted from occupational hazard, automobile accidents.[3] Other causes of amputations can be congenital, diabetes, gangrene and infections resulting from lack of basic public health. Partial finger amputations lead to functional deficiencies, aesthetic problems resulting in poor self-esteem, and psychological instability and economic damage to the individual.Many materials such as Acrylic, Polyurethane, polyvinylchloride have been used to produce finger prosthesis.[7] The restoration of the lost limb, finger depends upon the amount of the tissue involved and bone involvement, the level and the angle of amputation along with the number of fingers involved and the choice and acceptance of the person for the restoration of the finger. There are numerous replacement techniques accessible to restore the finger.[8] A well fitted and color matched prosthesis gets rid of the constant reminder of disability to a person.[9][10]

Conclusion

Rehabilitating the finger or its partial finger segment with an artificial prosthesis can be rewarding and satisfying with a pleasant outcome for a maxillofacial prosthodontist. The artificial prosthesis given can greatly enhance the psychological health, self-esteem of the patient. The process requires great skill, technique sensitivity and artistic skills along with the understanding of the patients need.

Ethical Clearance: Not Applicable

Source of Funding: Self

Conflict of Interest: Nil

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Lower Extremity Perfusion among Patient with Type 2 Diabetes Mellitusin a Tertiary Care Hospital, Kochi

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Abstract

Introduction: Diabetes as one of Non-communicable diseases has consumed a large share of money, material, time and human resources of health systems. Now, due to advancement in lifestyle and industrial process, prevalence of diabetes and its associated complications have been raised. Among these complications, diabetic foot considered as a common complication of diabetes.

Method: The present study was a quantitative quasi experimental two group pretest posttest design. The study was done at Amrita Hospital, Kochi. The main objective of the study was to evaluate the effectiveness of Burger Allen exercise on level of lower extremity perfusion among patients with type 2 Diabetes Mellitus. Totally 100 samples were taken in which 50 are in experimental and 50 in control group using convenience sampling technique.

Results: In the present study, majority were males with the average age among experimental group were 55.30 +- 4.58, 36(72%) and 55.30+- 4.58, 34 (68%) in the control group. The study result showed that mean and standard deviation of ABPI score among both groups on Day 1(0.07±0.01), day 2 (0.05±0.02) and day 3(0.19±0.01). There was statistical significance with the p value <0.01. There was also significant difference between the groups and within the groups in ABPI scores in 3 days among patients with type 2 DM which is significant at <0.05.

Conclusion: In the light of present study result, it depicted that the Buerger Allen exercise improve lower extremity perfusion among patient with type 2 diabetes mellitus.

Keywords: *Buerger Allen exercise, Lower extremity perfusion, Type 2 diabetes mellitus.*

Introduction

Diabetic mellitus is a group of metabolic disease in which defects in insulin secretion or action result in elevated blood glucose (hyperglycemia). In 2017, The WHO global report on diabetes demonstrates that the number of adults living with diabetes is 422 million adults. 1.6 million deaths are directly attributed to diabetes each year. Type 2 DM accounts for around 90% of all diabetes worldwide.[1] Reports of type 2 diabetes in children have increased globally. Diabetes currently affects more than 62 million Indians, which is more than 7.1% of adult population. The average age of onset is 42 years. Nearly 1 million Indians die due to diabetes every year. Kerala is known as diabetes capital of India as prevalence of diabetes is high 20% which is double the national average of 8%. As compared the prevalence in Thiruvananthapuram was 17%, in Hyderabad and New Delhi 15%, in Nagpur 4% and in Dibrugarh 3%.[2]

Diabetic foot complication is a major cause of disability, reduced quality of life, prolonged hospitalization, financial loss, lower limb amputation and mortality rate. [3,4] People with diabetes develop foot ulcers because of neuropathy, vascular insufficiency and impaired wound healing. [5] Nearly 90% of diabetes relayed lower limb amputations were preceded by foot ulcers.[6] The value of these exercises had frequently been emphasized by Allen, many medical experts considered them as important adjuvant treatment and postoperative

care for circulatory disturbances in the extremities.[7,8] The exercises involve the individual lying flat in bed with the legs elevated at 45 degrees until blanching occurs or for a maximum of 2 minutes. The patient then sits at the edge of the bed with the feet hanging down. Further exercises include dorsiflex, plantar flex, then inward and outward movement of the feet, followed by flexing and extending of the toes for 2 minutes. Finally the individual lies supine with the feet covered with a warm blanket lasting 5 minutes. The whole cycle is repeated 3 to 6 times each session, and the complete sequence is repeated 2- 4 times a day.[9]

The ankle brachial pressure index is a simple non-invasive and inexpensive diagnostic tool of choice for diagnosing peripheral artery disease in diabetic patients. The ABPI is the ratio of the systolic blood pressure in the angle to the systolic blood pressure in the arm. It is an objective indicator of arterial disease that allows the examiner to quantify the degree of stenosis. Doing exercise will help the patient to improve the vascularization and at the same time it will help to improve the wound healing process.

People with long standing Diabetes mellitus develop complication of PAD, which leads to grave complications like gangrene in the lowerlimbs. The most common symptom is muscle pain in the lower limbs on exercise. Indiabetes, pain perception may be blunted by the presence of peripheral neuropathy. Therefore, a patient with diabetes ismore likely to present with an ischemic ulcer or gangrene. The use of ankle-brachial-pressure index in the clinic and bedside provide a measure of blood flow to the ankle. This could help early detection,initiate early therapy and may thus reduce the risk of critical limb ischemia and limbloss.

Buerger Allen Exercise is one of the intervention to stimulate the development of collateral circulation in the legs. Primary care providers should focus on prevention by early recognition and prevention of PAD to those at increased risk. An awareness of diagnostic and treatment strategies will enable primary care provide providers to educate patients. This will help to improve both concordance with treatment and disease outcome. Considering the above factors and review of literature, the investigator felt that all patients with diabetes mellitus should do the

Buerger Allen Exercise to improve lower extremity perfusion.

Methodology

The present study was a quantitative quasi experimental two group pretest posttest design. The study was done at Amrita Hospital, Kochi. The main objective of the study was to evaluate the effectiveness of Burger Allen exercise on level of lower extremity perfusion among patients with type 2 Diabetes Mellitus.

Selection method of the study participants: The study included all patients between 45-60 years with Type 2 Diabetes Mellitus and whose ABPI score was 0.9 -0.4. The sample size was obtained using Master software based on previous article conducted by John J and Rathiga R on effectiveness of Buerger Allen Exercise to improve the lower extremity perfusion among patients with type 2 diabetes mellitus with -80% power, 95% Confidence interval minimum sample size 10 in each group. Totally 100 samples were taken in which 50 are in experimental and 50 in control group using convenience sampling technique. The study excluded patients who are unconscious, disoriented, critically ill, on anti-coagulant therapy, on treatment of deep vein thrombosis and also who are not willing to participate. The ABPI score was obtained by dividing the highest ankle systolic pressure to the highest brachial systolic pressure. After obtaining written informed consent, the ABPI was measured in each subjects and those subjects whose ABPI score was between 0.9 to 0.4 had been given the Buerger Allen Exercise for 12-13 minutes on three days. On the third day again the ankle brachial pressure index was calculated. Ethical clearance had been obtained from the Thesis review committee of AIMS and research Committee of Amrita College of Nursing.

Software Used for Data Entry, Compilation and Statistical Analysis: Microsoft Excel spread sheet was used for data entry and data analysis was done using the SPSS 20.0 version. In this study the quantitative data were expressed in terms of descriptive statistics. Paired t-test had been used for comparing statistical significant to compare the pre- test and post–test scores of ankle brachial pressure index among Type 2 Diabetic Mellitus patients. Chi-Square test was used to find out the association between ABPI score and selected demographic variables.

Ethical consideration: The project has been approved by the ethics committee of the institution. Informed consent was obtained from the participants before initiating the study.

Results

In the study, the average age of experimental group is 55.30 +- 4.58. 36 (72%) were males, almost 45 (90%) had education up to secondary level, 32 (64%) subjects were employed, 23 (46%) were doing sedentary and moderate work each, 46 (92%) were non- vegetarian diet, 29 (58%) had no ill habits and 33 (66%) had type 2 DM for more than 11 years. Whereas in the control group, the average age is 55.30+- 4.58, 34 (68%) were males, 41 (82%) had education upto secondary level, 26 (52%) were unemployed, 31 (62%) were moderate workers, almost 45 (90%) were following non vegetarian diet, 34 (68%) had no ill habits.

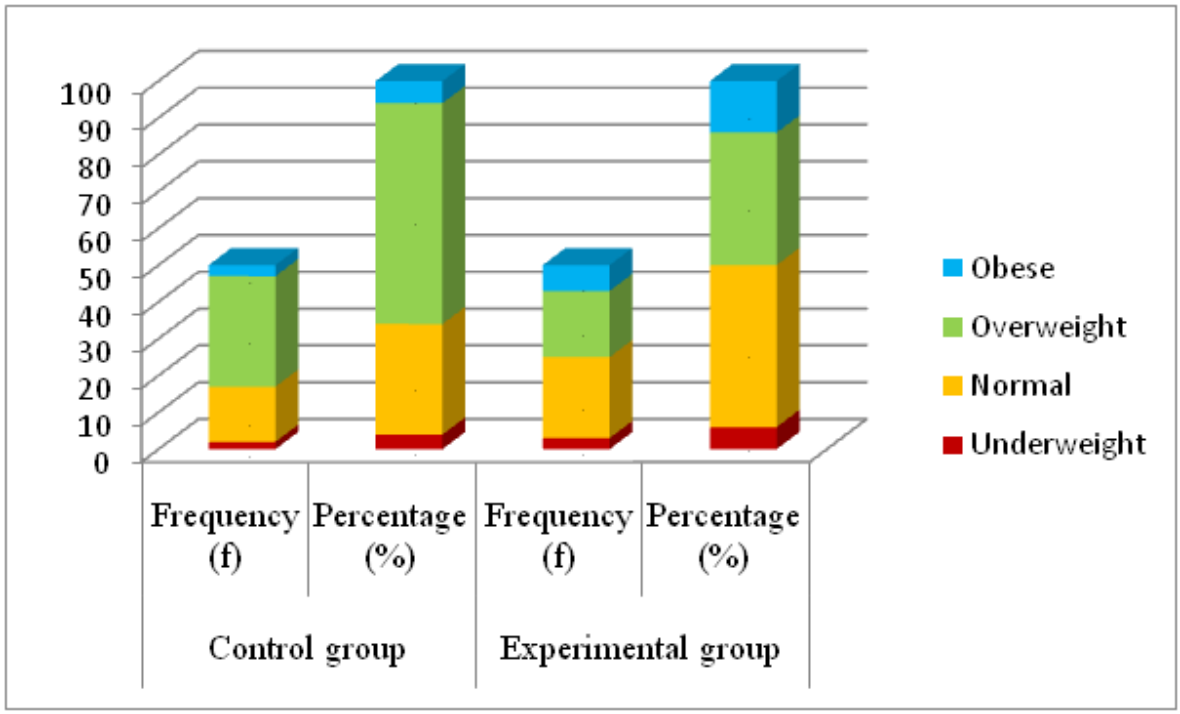

Figure 1: Frequency and percentages distribution of BMI among patients with Diabetes mellitus in control and experimental group. N = 100

In the present study, the result shows that BMI category in control group were 2(4%) underweight, 15(30%) normal, 30(60%) overweight and 3(6%) obese. In experimental group, 18(36%) were overweight and 7(14%) were obese.

Table 1: Comparison of mean, median and standard deviation of clinical variables among patients with diabetes mellitus in control and experimental group. N=100

Group	Clinical Parameters	Mean	Median	Standard Deviation (SD)
Control Group	Height	159.24	158	6.14
	Weight	64.96	65	9.95
	BMI	25.56	25.8	3.10
Experimental Group	Height	159.24	160	5.17
	Weight	64.48	60	11.71
	BMI	25.42	24.69	4.33

The above table shows that among the control group the mean and standard deviation of height, weight and BMI is (159.24± 6.14), (64.96± 9.95) and (25.56± 3.10) respectively. In the experimental group the mean and standard deviation of height, weight and BMI is (159.24±5.17), (64.48±11.71) and (25.42±4.33) respectively.

Table 2: Mean and standard deviation of Ankle brachial pressure index among control and experimental group. N=100

ABPI Score	Mean	Standard Deviation	F	p- value
Day 1	0.07	0.01	4.44	0.00**
Day 2	0.05	0.02	2.88	0.01*
Day 3	0.19	0.01	0.60	0.00**

Data present in the table shows that mean and standard deviation of ABPI score among both groups on Day 1(0.07±0.01), day 2 (0.05±0.02) and day 3(0.19±0.01). There was statistical significance with the p value <0.01.

Table 3: Comparison of ABPI scores among patient with diabetes mellitus in between and within the control and experimental groups. N=100

Variables	Days		Mean	Sum of square	df	F	p-value
ABPI score	Day 1	Between groups	0.135	0.13	1	45.55	0.000*
		Within groups	0.003	0.29	98		
	Day 2	Between groups	0.064	0.06	1	6.68	0.01*
		Within groups	0.009	0.93	98		
	Day 3	Between groups	0.984	0.98	1	349.92	0.000*
		Within groups	0.003	0.27	98		

The table 3 depicts the significant difference between the groups and within the groups in ABPI scores in 3 days among patients with type 2 DM which is significant at <0.05. There was no association between the demographic variables and the ABPI score

Discussion

Diabetes is a complex metabolic disease. A Non pharmacological natural approach is needed to overcome that problem. Burger's Allen exercise is a simple, which is easy to do, have no notable side effects and most acceptable one to reduce Diabetes mellitus.

In the present study, the average age of experimental group is 55.30 +- 4.58. 36 (72%) were males, almost 45 (90%) had education up to secondary level, 32 (64%) subjects were employed, 23 (46%) were doing sedentary and moderate work each, 46 (92%) were non- vegetarian diet, 29 (58%) had no ill habits and 33 (66%) had type2 DM for more than 11 years. Whereas in the control group, the average age is 55.30+- 4.58, 34 (68%) were males, 41 (82%) had education upto secondary level, 26 (52%) were unemployed, 31 (62%) were moderate workers, almost 45 (90%) were following non vegetarian diet, 34 (68%) had no ill habits.

Another study conducted by M. Vijayabarathi (2013) on effectiveness of buergerallen exercise on wound healing process among the diabetic foot ulcer patients admitted in diabetology department which results showed that in considering the age wise distribution, 36.7% of subjects were in 50 to 60 years of age, in the experimental group. In the control group 33.3% of subjects were more than 60 years of age. In the sex wise distribution, females were high in both experimental and control group as 80.0% and 83.3%.In Experimental

group majority was educated up to primary education 50.0% (15) and in Control group 63.3% (19) equally educated up to primary education and High School. When considering the type of family most of them belong to nuclear family in both the groups. In both the groups when considering the education status most of the subjects had only primary education.[10]

The present study shows that 30 (60%) subjects are overweight in control group whereas in the experimental group most of the subjects 22 (44%) have normal BMI.

Leelavathi M. (2015) conducted a study on effectiveness buerger'sallen exercise on improving lower extremity perfusion among patients with diabetes mellitus which inferred that most of the patients with diabetes mellitus had B.M.I. of 25-29 (43.3%, 43.3%). Increased BMI was associated with increased prevalence of diabetes mellitus. An increase in body fat is generally associated with increased risk of metabolic diseases such as type II diabetes mellitus.[11]

Data present in the table shows that mean and standard deviation of ABPI score among both groups on Day 1(0.07±0.01), day 2 (0.05±0.02) and day 3(0.19±0.01). There was statistical significance with the p value <0.01.

Dr. Aruna S, Thenmozhi P (2015) conducted a study on effectiveness of allenbuerger exercise in preventing peripheral arterial disease among people with type 2 diabetes mellitus. Experimental Research Design with 30 samples in experimental group and 30 samples in control group were selected by using random sampling technique at Kuthambakkam village. The findings of the study revealed that there is a significant improvement in Ankle-Brachial index Score in preventing peripheral arterial disease among people with Diabetes Mellitus in experimental group after receiving Allen Buerger exercise at the level of P<0.05. Independent t test revealed that there is significant difference between the experimental group and control group in preventing peripheral arterial disease among people with Diabetes Mellitus at the level of P<0.05.[12]

Anju Kumari, Kanika Rai, Vinay Kumari, Dr Jyoti Sarin conducted a study on effectiveness of buergerallen exercise on foot perfusion among patients with diabetes mellitus showed that (50%) patients were suffering from comorbid illness in which 56.6% were suffering from hypertension, 8/30 (26.6%) were suffering from Chronic Kidney Disease (CKD), 1/30 (3.33%) was suffering from CVA, 04/30 (13.3%) were suffering from CAD, and 30/60 (50%) of patients were not suffering from any comorbid illness.[13]

In the present study, the significant difference between the groups and within the groups in ABPI scores in 3 days among patients with type 2 DM which is significant at <0.05.

Jemcy John and A Rathinga conducted a research study showed a significant improvement in the lower extremity perfusion after the Buerger Allen exercise. Data depicts that the mean post- test ankle brachial index score was higher than the mean pre-test ankle brachial index score. The calculated t value was greater than the table value. The computed t value shows that there was a significant difference between the two mean ankle brachial index score.[14]

Mellisha MS conducted a study on effectiveness of buergerallen exercise on lower extremity perfusion and pain among patients with type 2 diabetes mellitus showed that in the experimental group, the mean score of level of lower extremity pain was reduced from 4.33 to 1.30. The reduction of pain was statistically significant difference at 1% level of significance (p=0.001). The mean score of level of lower extremity perfusion was increased from 44.50 to 52 and it showed a statistically significant difference at 1% level of significance (p=0.001).[15]

The above finding clearly indicates that the Buergerallen exercise was found to be an effective on lower extremity perfusion among patients with type 2 Diabetic Mellitus.

Conclusion

The study concluded that the study participants got benefited by Allen Buerger exercise in preventing Peripheral Arterial Disease among patients with type 2 Diabetic Mellitus. Nurses plays a significant role in preventing Peripheral Arterial Disease there by reducing the risk of amputation and restore normal function of the extremity by encouraging them to do the exercise which will help to improve the quality of life. It also suggests that Buerger's exercises could be an alternative procedure on improving peripheral circulation.

Conflict of Interest: There is no conflict of interest for the study.

Source of Interest: Not a funded study.

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A Glimpse of Manual Scavanging in India

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Abstract

Across India, manual scavenging and its allied forms—the manual cleaning of dry latrines, sewers, manholes and septic tanks, abstraction of debris from sewage canals and any interaction with excreta—are openly prevalent, defined as a "cultural vocation". "In India, every five days, a manual scavenger dies in a sewer, septic tank or a manhole," the report verbally expressed. However, its scope was constrained as its primary source of data was statistics from NCSK, which has disarrayed information organised arbitrarily. The few key features of the Act Prohibits the expression or maintenance of insanitary toilets, Prohibits the engagement or employment of anyone as a manual scavenger, Violations could result in a years' imprisonment or a fine of INR 50,000 or both. The press Information Bureau, Government of India, Ministry of Social Justice and Empowerment has verbally expressed that a Task Force was constituted for carrying out a National Survey of manual scavengers in 2018 in 170 identified districts of 18 states. The right technology is considered as one of the solution to eradicate this scourge. In spite of that, the social and gender issues should be abolished by educating pupil about this ill.

Keywords: *Manual scavengers, manholes, insanitary latrines, health issues.*

Introduction

Across India, manual scavenging and its allied forms—the manual cleaning of dry latrines, sewers, manholes and septic tanks, abstraction of debris from sewage canals and any interaction with excreta—are openly prevalent, defined as a "cultural vocation" annexed to a few make-believe lower castes—Hindu Dalits, a few Dalit Muslims and some converted Dalit Christians. In India, this affair is hazardous, unsafe, unsanitary, degraded and above all, illicitly proscribed by Parliament a few years ago. The level of susceptibility increases as we peregrinate from rural to urban areas. However, reports designate that these days; there is incremented fatality in rural India, as well.[1]

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The data from the National Commission for Safai Karmacharis (NCSK) revealed appalling facts on the pattern of the deaths of manual scavengers from January 2017 to September 2018 and were widely shared by media houses and convivial media users. "In India, every five days, a manual scavenger dies in a sewer, septic tank or a manhole," the report verbally expressed. However, its scope was constrained as its primary source of data was statistics from NCSK, which has disarrayed information organised arbitrarily.

Manual Scavenger at work–A bitter truth of reality: The two major Acts have been since 1993 by Parliament to ban and control manual scavenging. One of the Act passed by Narsimha Rao Government in 1993 created a history in the legislation banning manual scavenging altogether and aimed at rehabilitation of scavengers followed by passing of another Act in 2013 by UPA II after it was reported that manual scavenging still persists despite a slow progress.[2]

According to the India census of 2011, there are more than 2.6 million dry latrines in the country. Along with that toilets with human excreta flushed in drains is 13, 14,652 and 7, 94,390 dry latrines are cleaned manually. It has as well been identified that seventy three percent of these are in rural areas and twenty seven in urban areas.

The few key features of the Act are

Prohibits the expression or maintenance of insanitary toilets

Prohibits the engagement or employment of anyone as a manual scavenger

Violations could result in a years' imprisonment or a fine of INR 50,000 or both

Prohibits a person from being engaged or employed for hazardous cleaning of a sewer or a septic tank[3]

Offences under Act are cognizable and non-bailable calls for a survey of manual of scavengers in urban and rural areas within a time limit framework. While the Act is encouraging in that it focuses on the duty of official to ensure its implementation, it does not outline administrative measures beyond conduct rules that can be imposed if officials do not implement the Act.

The mundane accidents include falls/slips fire or explosion, oxygen depletion, heat stress, drowning, asphyxiation arising from gas, gas poisoning, vapour and entrapment by free flowing solids. Amongst these hazardous gases etc are facilely overlooked or neglected leading to earnest causalities.[4]

Definition: Manual scavenging refers to the unsafe and manual removal of raw (fresh and untreated) human excreta from buckets or other containers that are used as toilets or from the pits of simple pit latrines.

According to the Indian Law, 1993, Manual scavengers means a person engaged or employed at the commencement of this Act or any time thereafter, by an individual or a local authority or an agency or a contractor for manually cleaning carrying, disposing of or otherwise handling in any manner, human excreta in an insanitary latrine or in an open drain or pit into which the human excreta from the insanitary latrines is disposed of, or railway track or in such other spaces or premises, as the central government or a state government may notify, before the excreta fully decomposes in such manner as may be prescribed, and the expression 'manual scavenging' shall be construed accordingly.[5]

The prohibition of Employment of Manual Scavengers and their Rehabilitation Act, 2013, defines a manual scavenger as an individual employed by a local authority or agency for manually cleaning, carrying and disposing of human excreta from insanitary latrines.[2]

Categories of Sanitation Workers: A caste predicated and hereditary vocation, which is bequeathed, as a legacy from one generation to the next; "manual scavenging" has been an age-old routine for this community, which is untouched by technological advancement in sanitary practices.

i. **Sewer Cleaners:** These cleaners are involved in unblocking and cleaning of the permissive wastewater drains. The work is need based (pluvial season) and infrequently for preventive maintenance. The sewer gas is a complex amalgamation of toxic and non toxic flatulency engendered and accumulated in sewage system by the decomposition of organic home or industrial waste.

ii. **Latrine Cleaners:** They are involved in cleaning the process of evacuating dry/single-pit latrines preferably in rural areas. The process involves daily amassment and convey/evacuating of faecal matter.

iii. **Faecal Sludge Handling:** The scavengers muddled in faecal sludge by emptying, collecting and transporting human waste from septic tanks. The work is carried out on demand. The frequency of de-sludging ranges from six months to 10 years.

India does not even have categorical licit provisions cognate to the management of faecal sludge, additionally called septage in municipal parlance, albeit a number of laws cover sanitation accommodations and environmental regulations.[6]

iv. **Railway Cleaners:** These employees cleans the human excreta i.e. remains of a train that has ended its journey, leftover food, packets and paper boxes

from the track as well as cleaning of the railway toilets. All these activities are carried out several times a day. These workers are employed by private contractors to whom the India Railways has outsourced. Most of the time when the water doesn't get the job done or the drains get clogged, the cleaners have to scoop up the excreta with ply boards using their bare hands without any precautions.[7]

v. **Treatment Plant Workers:** Treatment plant workers maintain and operate sewage and faecal sludge treatment plants on a quotidian footing. Workers are mostly in urban areas spread across India – working in the 527 STPs/FSTPs.[8]

vi. **Community and Public Toilet Cleaners:** These workers are engaged in maintaining the public toilets on daily basis. The workers belong to the rural and urban areas of slums and public convenience shelters. The task of these cleaners (halalkhors) is still the same as of colonial era.[9]

Statistics on Manual Scavengers in India: According to the findings of the socio-economic and caste census, 2011, the Ministry of Rural Development (Government of India) has revealed that that a paramount number of manual scavengers were analyzed in the state of Maharashtra followed by Madhya Pradesh at second position. The other states in the line of higher number are Jammu and Kashmir, Karnataka, Tripura, Punjab, Uttar Pradesh, Daman and Diu, Bihar. The census has as well acknowledged that Tamil Nadu, Kerela, Goa, Andhra Pradesh, Telengana, Gujrat, Assam and Manipur have no manual scavengers. These statistics are based on the number of households in the states. This survey communicates that India has 18.06 lakh manual scavengers in the country.[10]

The press Information Bureau, Government of India, Ministry of Social Justice and Empowerment has verbally expressed that a Task Force was constituted for carrying out a National Survey of manual scavengers in 2018 in 170 identified districts of 18 states. The national Survey concluded in 163 of the 170 identified districts. A total of 50,644 persons registered themselves in the survey camps. It was claimed that 20,596 persons have been accepted after identification with subsequent verification as manual scavengers. Data of the identified manual scavengers is being digitized in National Safaikaramcharis Finance and Development Corporation. Besides that the data of remaining 11,757 manual scavengers were digitized upto October 2018. Onetime cash assistance has been relinquished to 8438 identified manual scavengers.[11]

Schemes Available for Manual Scavengers: The National Safai Karamcharis Finance and Development Corporation (A Government of India undertaking the Ministry of Social Justice and Empowerment) introduced Self Employment Scheme for Rehabilitation of Manual Scavengers (SRMS) and their dependents in alternative occupations by 2009. According to the updated number announced by States/UTs, 1.18 lakh manual scavengers and their dependents in 18 States/UTs were determined. One from each family of the identified manual scavenger is eligible for receiving cash assistance of Rs. 40000 immediately after their identification. The beneficiary is sanctioned to withdraw an amount of Rs. 7000 maximum in monthly instalments.

The quantum of loan upto a maximum cost of Rs. 10 lacs is permissible under this scheme and a sum of Rs. 15 lacs in case of sanitation related projects such as vaccum loader, suction machine with vehicle, garbage disposal vehicle etc. which are immensely compatible for target group with high success rate and income. The moratorium period is of two years. The repayment mode is of five years including the period of moratorium for the projects upto five years.[12]

Beneficiaries can as well avail the facility of subsequent loan from banks, if needed without capital and interest subsidy.

The training is administered to the beneficiaries for gaining new skills and entrepreneurship capabilities. The training is being provided by govt. agencies/Institutions along with the reputed specialized training agencies. The training is given as per their level of education and aptitude.[12]

Remedies: The solution, it seems, is a public-private partnership. Collaboration would work best because it would ravage the mafia of private cleaners, making them accountable

It was also found that some scavengers have endeavoured to challenge their social and economic status by transmuting their jobs. But determinately, they have to return to their pristine profession because of a social boycott and the lack of foothold from both private and governmental agencies. The law and order machinery has additionally proved inefficient.

Eradication of manual scavenging needs to be worked out on war footing. A mission for total eradication of manual scavenging and rehabilitation of manual scavengers needs to be set up and implemented by the government.

The right technology is considered as one of the solution to eradicate this scourge. In spite of that, the social and gender issues should be abolished by educating pupil about this ill.

The sewage handlers come across with multiple health issues such as respiratory and skin diseases, anaemia, jaundice, carbon monoxide poisoning and sometimes leads to death. The health issues should be taken care by the agency and safety equipments to be provided before handling. Vaccination against hepatitis A, E-Coli, Rotovirus, Norovirus must be administered to these workers to avoid deaths at young age of their life.

The construction of toilets under Swachh Bharat Mission on a large-scale was built under single pit toilets but the cleaning of these excreta is carried out by manual scavengers. Therefore, a technology based structure should be introduced to dispose of waste and reduce the figures of manual scavengers.

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Source of Funding: Self

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Out of Pocket Spending for Natal Care Services: A Comparative Analysis among High and Less developed States in India

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Abstract

In this paper attempt is made to assess the expenditure incurred on natal health care services in India at two different socio-economic settings. Data for the analyses are drawn from the 71st round of NSSO held in 2014. A logistic regression model used to assess the determinants such as socio-economic and demographic indicators on expenditure incurred for natal care services. It is found that a major proportion of respondents spent money for their natal care however a wide difference was noticed between high and low HDI states in India. The average amount spent from their pockets for natal care services was Rs.6,685/- for high HDI states. It was almost double times higher than the low HDI sates' expenditure incurred for natal care (Rs. 3,400). The results of the logistic regression analysis on expenditure incurred for natal care is positively and significantly associated with all the socio-economic, demographic variables (except age, religion). In India, the natal health care services are offered free, yet many families' average out of pocket natal health care expenditure incurred was relatively high, however, a wide variation is witnessed among high and low HDI states. Hence, it is suggested to increase the share of state's expenditure on healthcare, especially those states which are socially and economically backward states, to reduce the state differences in the country on health outcomes.

Keywords: *Natal care, out-of-packet expenditure, wealth index, Human Development Index.*

Introduction

In many developing countries, household out-of-pocket (OOP) spending on health constitutes a significant share of total health care expenditure. The WHO estimates, that globally, private expenditure on health in most countries is approximately 1.5 to 3.0 percent of their Gross Domestic Product[1]. In much of the Asian region, public funding of healthcare is low, forcing most households to pay essential healthcare bills out of their pockets. These payments hit the poor particularly hard[3]. Globally, the affordability costs of treatment are known to be a major barrier in accessing essential care, potentially imposing considerable burdens on households[2].

The progress in improving maternal health, as envisaged in the UN MDGs, critically depends on the availability, affordability and effective use of reproductive health services[3]. In India, out-of-pocket expenses made up over 70 percent of the total health expenditure[4]. The total health expenditure constituted 4.1 percent of GDP of India (2009), with private and public sectors accounting for 78 percent and 20 percent respectively[5]. These additional expenses not only deter women from accessing health care services but also push households further into poverty[6,7,8,9]. Peters estimated that a quarter of the Indian population fall into poverty as a direct result of the medical expenses incurred through hospitalisation[10].

The expenses incurred during child bearing also varied with the place of antenatal care (ANC), indicating that the contact with private facility at any stage of pregnancy will increase cost per delivery[11]. Studies on OOPE[12], [13] established the fact that out of pocket expenditure on health care services is a significant factor in choice of the institutional facility for ante-natal and delivery care in India. Van DE and others found that Out of pocket payment is the main source of financing health care throughout Asia, more than 72 percent of

expenditure on health care is financed by out of pocket in India[14].

Studies conducted by Mukherjee et al. (2013) and Douangvichit et al. (2012) on OOP expenditure consistently report higher expenditure for deliveries conducted in private health care centres and for complicated deliveries and caesarean deliveries [15, 16]. There are some hidden costs like - transportation cost, medicines, and other expenses, which also affect the utilisation of reproductive health care services. Some studies found that cost of travel, drugs, and hike in fees structure are negatively related with utilisation of health care services[17]. Saraswati Kerketta (2015) found that there were differentials between public and private health facilities in terms of out of pocket expenditure on maternal care services in India[18]. Under this backdrop here an attempt is made to assess the expenditure incurred on natal health care services in India at two different socio-economic settings. The specific **objectives** of the research paper are

- to understand the socio, economic and demographic characteristics of the study population in high and less developed states
- to examine the expenditure pattern of the respondents on natal care services at two different HDI settings
- to explore the relationships between socio-economic and other characteristics of households and natal health care expenditures in different settings of India

Data Method: Data for the analyses are drawn from the 71st round of the National Sample Service Organization held in 2014. Though the survey covered the whole of the Indian Union, this study made an attempt to classify the states into two different socio-economic settings by using the 2011 Human Development Index. The top five HDI states were grouped as High HDI states viz Kerala, Punjab, Himachal Pradesh, Maharashtra and Haryana. The bottom five HDI states were grouped as Low HDI states such as Orissa, Bihar, Chhattisgarh, Madhya Pradesh and Jharkhand. Totally 7,004 women (3285 from High HDI states and 3719 from Low HDI states) who had get pregnancy during the last 365 days were considered for this analysis.

Background characteristics of the sample population: Age distribution of the sample population discloses a slight difference between high and low HDI states. The proportion of ST population among low HDI states was three time higher than the high HDI states (19.5 and 6.4 percent respectively). The illiterate proportion was around four times higher among low HDI states than the low HDI states (30.7 and 8.3 percent respectively). The regular wages/salary earning people was relatively high in high HDI states (42.7 percent) than the low HDI states (29.9 percent). More than one-third of the high HDI states' respondents were fall in the richest wealth (35.8 percent) whereas this proportion for low HDI states was just 5.6 percent.

Payments incurred for Natal care: It is inferred that there is wide difference was noticed between high HDI states and low HDI states with regard to pocket payments on natal care services. Of the 3,094 households who made payment for natal care in the high HDI states, little less than one-fifth of the households spent up to 1,500 rupees for natal care (19.0 percent) and at the same time more than two-fifth of the households in this group spent above 5,000 rupees for natal care services (46.0 percent). The corresponding percentage for the low HDI states was 36.3 percent and 23.8 percent respectively. Overall, the average amount spent from their pockets for natal care services for high HDI states was Rs. 6,685. It was almost double times higher than the low HDI sates' expenditure incurred for natal care (Rs. 3,400).

Table No. 1: Percentage distribution of women by payments incurred for Natal care in High and Low HDI states

Expenditure Incurred (in Rs.)	High HDI		Low HDI	
	%	Total	%	Total
Total expenditure incurred on Natal care* 427.687**				
Up to 1,500	19.0	588	36.3	1148
1,501-3,000	16.5	512	23.2	732
3,001-5,000	18.5	572	16.8	530
Above 5000	46.0	1422	23.8	751
Total	100.0	3094	100.0	3161
Average amount spent (in Rs.)	6685.86		3400.70	

***Refers to significant at 1% level (chi-square results–Expenditure incurred and different HDI states)

Socio-economic and demographic determinants of out of pocket payments for Natal care services: Irrespective of age groups, more than two-fifth of the high HDI states' households was spent above 5,000 rupees for natal care from their pockets. It ranges from 51.5 percent among 30-34 age group to 42.5 percent among 20-24 age group. On contrast, less than one-fourth of the households in the low HDI states incurred above 5,000 rupees for natal car, irrespective of age groups. It is inferred that while age increases, the amount spent for natal care also increase. However, a wide variation was witnessed between high and low HDI states.

Amongst the socio-economic characteristics, place of residence has been found to have the strongest association with the pocket payment for natal health care services. More than half of the urban women who fall in the high HDI states were spent above 5,000 rupees for natal care (52.8 percent). On contrast, just one-third of the respondents in the low HDI states were paid above 5,000 rupees for natal care services (32.7 percent). Religion of the respondents and the pattern of payment incurred for natal care analysis show a strong association among the high and low HDI states. Caste of the respondents can also be an important determinant of the expenditure incurred for natal health care. Both at high and low HDI states, ST population spent for natal care was quite low than the rest of other caste population. However a wide difference was noticed between high and low HDI states' sample population. As educational level of respondents increases, their amount incurred for natal care also increases, irrespective of HDI status. However, a wide difference was noticed between high and low HDI states. A similar observation was noticed with respondents' occupational status at both the HDI settings and at the same time a wide difference also noticed between high and low HDI states.

There is a steady increase in proportion of rural women who spent more money (above Rs.5,000) from 22.7 percent among poorest wealth index women to 34.2 percent among women living at middle wealth index then to 53.2 percent among richest wealth index women in the high HDI states. The corresponding figures for urban high HDI states were 34.7 percent, 48.2 percent and 72.6 percent respectively. A similar increase also noticed among the low HDI states; however the proportions were ranged between 13.1 percent in poorest group to 38.8 percent for richest group among rural women and it ranged from 22.4 to 67.9 percent respectively. The bivariate analysis shows that the women's age, place of residence, caste, educational status, occupation, wealth index and outcome of pregnancy are is significantly associated with the expenditure incurred for natal care both among high HDI states and low HDI states. It is inferred from the analysis on average expenditure incurred for natal care that Kerala state stood at top with Rs. 9,114/- which is the highest spending state among high HDI state. The lowest amount spent for natal care among the high HDI state was Himachal Pradesh with Rs. 3,929/-. On contrast, the maximum amount spent for natal care services among low HDI state was Orissa with Rs. 4,187/- The least amount was recorded by Chhattisgarh with Rs. 2,393/-.

In order to determine the association between each independent variable and the expenditure incurred for natal care, two statistics of the model are used. The results of the logistic regression model (separately for HDI groups as well for rural and urban) comparing households who spent less money (less than 1,500/-) with those of household spent more money (above 1,500/-) (Less money = 0; More money = 1).

The results of the logistic regression analysis on less money spent with those of more money spent for natal care show that households which spent more money is positively and significantly associated with caste, educational status, wealth index and states variables among rural sector both at high and low HDI states. All the variables the odds increase with the categories of a variable when compared to the respective variable's reference category, indicating an increase in expenditure incurred when improving the background conditions of women. This model (rural) also shows that the age, religion, and occupation were insignificantly determining the expenditure incurred for natal care services both at high and low HDI states. A similar observation was noticed for urban high HDI states.

Table 2: Odds ratios from logistic regression examining the effect of selected background variables on expenditure incurred for natal care by place of residence

SED	Rural				Urban			
	High HDI States		Low HDI States		High HDI States		Low HDI States	
	Sig.	Exp (B)	Sig.	Exp (B)	Sig.	Exp (B)	Sig.	Exp (B)
Caste	***		***		**		**	
ST (ref)	.000	1.000	.000	1.000	.002	1.000	.009	1.000
SC	.000	2.398	.001	1.695	.368	1.413	.748	1.105
OBC	.000	2.776	.001	1.570	.002	3.340	.021	1.917
Others	.000	3.158	.000	2.213	.079	1.936	.031	1.936
Edu. Status	**		***		***		***	
Illiterates (Ref)	.001	1.000	.000	1.000	.000	1.000	.000	1.000
Primary	.420	1.206	.040	1.293	.889	.954	.956	.988
Middle/Sec	.205	1.317	.000	2.183	.048	1.845	.002	1.876
Hr Sec/Diploma	.001	2.354	.000	2.668	.027	2.133	.030	1.750
Degree	.001	3.030	.000	4.491	.000	5.292	.000	3.298
Wealth Index	***		***		***		****	
Poorest	.000	1.000	.002	1.000	.001	1.000	.001	1.000
Poorer	.557	1.144	.000	1.569	.072	1.541	.392	.870
Middle	.105	1.450	.033	1.369	.068	1.570	.019	1.773
Richer	.002	1.948	.003	1.599	.002	2.339	.001	2.931
Richest	.000	2.558	.036	1.665	.000	5.050	.187	1.713
States	***		***		***		NS	
Bihar	.000	1.000	.000	1.000	.000	1.000	.051	1.000
Jharkhand	.001	2.737	.000	.450	.000	5.185	.753	1.078
Orissa	.093	.670	.000	1.811	.163	1.749	.095	1.514
Chhattisgarh	.000	2.393	.086	.700	.000	5.175	.294	.762
Madhya Pradesh	.000	3.763	.896	.982	.000	4.589	.198	.789
Constant	.004	.278	.033	.551	.022	.210	.378	.659
-2 Log likelihood	**1553.277(a)**		**2437.426(a)**		**954.515(a)**		**1253.497(a)**	

***, and ** denotes significant at 1% and 5% probability level respectively. NS- Not Significant

Conclusion

Though Government of India has been running lot of schemes for availing free of cost maternal health services but still one has to pay from their pocket as medical expenses. This paper also found that the average out of pocket natal health care expenditure incurred during delivery was relatively high particularly for high HDI states. In the multivariate regression analysis, as in the bivariate analysis, women's caste, education, and wealth index variables are continued to be strong predictors of the expenditure incurred for natal health care services. Above all, it is found from the analysis that there is a wide variation between two different socio-economic settings on payments incurred for natal care. Hence, particular attention should be paid to women living in low standard of living condition. In the light of the above discussion it can be suggested that poor people can be protected from maternal health expenditures by reducing a health system's dependence on out-of-pocket payments and to develop social insurance system. In addition, IEC activities must be given more emphasis, so that the under served population may also make the use of currently running health schemes, which may reduce the burden of expenditure. Apart from that the incentives provided to the beneficiaries' mothers must be revised from time to time based on inflation and growth rate. Finally, this research finding suggest to increase the share of state's expenditure on healthcare, especially those states which

are socially and economically backward states, to reduce the state differences in the country on health outcomes.

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Current Research in Neuropathology and Pharmacotherapy of Alzheimer's Disease: A Review

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Abstract

Background: Alzheimer's disease (AD), a category of neurological degeneration generally seen in elderly people which is reflected by memory loss and affecting daily living activities.

Method: The data has been accessed from scopus, pubmed, science-direct and google-scholar which is included in this article.

The literature provide the information about pathological alterations of Alzheimer disease emphasizing on formation of neuritic plaques, beta amyloid protein, neurofibrillary tangle and also updates therapeutics used in Alzheimer's disease including cholinesterase inhibitors, ACE inhibitors, NMDA receptor antagonists, secretase inhibitors and anti-inflammatory drugs, herbal drugs and other naturals.

Results: The research on neuropathology and diagnosis of Alzheimer's disease are determinants of this study. The pathophysiology, diagnosis using biomarkers and therapeutics of disease has been summarized.

Conclusion: The aim of this review paper is to focus on how diagnosis and pharmacotherapy of Alzheimer's disease useful for researchers engaged in the experimental research.

Keywords: *Alzheimer's disease, β-amyloid precursor protein, neurofibrillary tangles, Acetylcholinesterase inhibitors, Secretase inhibitors, biomarkers.*

Introduction

Alzheimer's disease (AD) is approved as a chronic, irreversible neurodegenerative disorder in many countries which produces various cognitive impairments in old people. Alzheimer's disease (AD) is indicated by memory loss and cognitive impairment which affect daily living activities. With an increase in the geriatric population in India, quantities of AD patients are increasing step by step[(1)]. The neuropathologists had distinguished 64 instances of amyloid plaques and NFTs, a cause of disease, at the time of Dr. Alois Alzheimer, in autopsied brains of AD individuals[(2)]. The extracellular deposition of Ab called Amyloid plaques; saw in parenchymatous cells of brain and furthermore in cerebral blood vessels called cerebral amyloid angiopathy (CAA)[(3)].

Currently such medications are approved by USFDA (US Food and Drug Administration), including five medications those are utilized for the treatment

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of cognitive manifestations of AD. NMDA receptor antagonist–memantine (Namenda) donepezil (Aricept), AChEIs –rivastigmine (Exelon), tacrine (Cognex) and galantamine (Razadyne, Reminyl) are drug of choice as per indications[4].

Pathophysiology of Alzheimer's Disease: In 1907, AD is known to treat subsequent to recognizing the pathophysiology of AD when neuropathological features of this disease observed and described by amyloidal plaques and hyperphophorylated NFTs and different hypotheses have been proposed[5] (Fig. 1). In last decade, it has been suggested that commonly used Ab hypotheses is responsible for complex pathophysiology of growing disease[6].

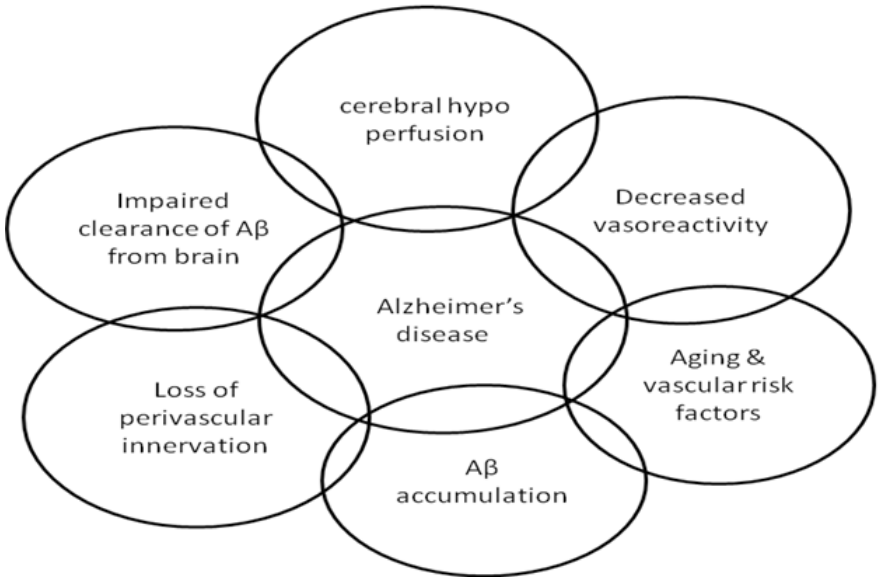

Fig. 1: Various pathophysiological processes causing Alzheimer's disease (AD)

In late stage, development of amyloid plaques is appeared in the older age of patients[7]. The breakdown of APP is occurred by α-secretase which is further by action of β-and γ-secretases in amyloid cascade hypothesis[8]. The activities of neurons and their related astrocytes are responsible for production of Ab42 oligomers. The cytokines like IL-1b, TNF-a, and IFN-g stimulate neighbour astrocyte-neuron which produces Ab42 oligomer[9]. Working of neuron–astrocyte complex is affected by oligodendroglia (OLGs) which are destroyed by Ab oligomers[10]. The aggregation of Ab oligomers also induces degeneration in neurons of AD patients[11]. It was proposed that receptor pharmacology of Ab activates neuroprotectiion mediating Ab42 monomers through signaling pathways of mediating receptors[12].

Use of Biomarkers in alzheimer's Disease: The cholinergic hypothesis of AD mechanism stipulates that most of cognitive manifestations are a result of cholinergic dysfunction[13].

Early Detection Strategies via Biomarkers: The magnetic resonance imaging and fluorodeoxy-glucose positron emission tomography determine hippocampus atrophy and cortical hypo-metabolism in AD progression. Advancements in science, radiology and system biology promotes use of biomarkers in AD research[14].

Biomarkers Using Cerebrospinal Fluid: Scientists have determined levels of Ab-42 peptide by knowing and total phosphorylated Tau protein (t-tau and p-Tau) and by estimating cerebrospinal liquid (CSF) which is responsible for neurodegeneration in AD. All three parameters have been proposed as one of the prevailing biomarkers for this disease which is independent of the apo-lipoprotein E (APOE) genotype [15]. The accuracy in AD symptoms and combining CSF Ab with either t-tau or p-tau level[16].

Biomarkers Using Imaging Techniques: Beta-amyloid load in the brain can be estimated through

positron emission tomography (PET) using amyloid ligands such as Pittsburgh compound B (PiB), florbetapir (AV-45). Amyloid PET is considered a strong biomarker which was incorporated in 2011 and re-evaluated by National Institute on Aging-Alzheimer's Association diagnostic criteria for AD. In spite of being an amazing screening instrument in clinical trials, there is as yet limited evidence as a diagnostic tool for AD in clinical practice [17].

Biomarkers Using Genetic Screening: Early AD was related with special autosomal dominant mutations in amyloid precursor protein (APP), and/or presenilin 1 (PSEN1), or presenilin 2 (PSEN2). At present, genetic testing for both PSEN1 and PSEN2 lay down in one family member with early-beginning of AD[18]. Lanoisele´e et al. observed the occurrence of AD, proposing potential advantage of screening non-familial cases of AD for these mutations[19]. Late-onset AD is most normally connected with APOE4 allele which is situated on chromosome 19q13.2 including regulation of Ab aggregation and clearance [20]. Besides, carriers of this allele have a lower onset of disease and more hippocampal atrophy in dose-dependent manner [21].

Strategies Used for Treatment of AD: Currently available medications N-methyl d-aspartate receptor antagonist (Memantine), acetylcholinesterase inhibitors (Rivastigmine, Galantamine, Donepezil) in the various stages of disease[22]. In AD, deletion of amyloid beta protein deposition is one of the most favorable targets for treatment.

Anticholinesterases: The drugs can change cholinergic neurotransmission, have been approved from regulatory authorities for Alzheimer's therapy [23]. Three ChEIs like Donepezil, Rivastigmine and Galantamine. Donepezil and Galantamine are usually used to get patients with mild to moderate AD. Rivastigmine inhibits both Acetyl cholinesterase and Butyryl cholinesterase associating the degradation of Acetyl choline[24].

NMDA receptor antagonist (Memantine): Memantine is a newer medication used in treatment of moderate to severe dementia. Its mechanism of action is a voltage-dependent, low-moderate affinity, uncompetitive NMDA receptor antagonism[25]. Memantine blocks abnormal glutamate activity which causes neuronal cell death and cognitive dysfunction[26].

Angiotensin-converting Enzyme (ACE) inhibitors: It has been seen that ACE inhibitors decrease aggravation in brains of AD patients [27]. The mechanism includes transformation angiotensin I to angiotensin II. Another possibility is that angiotensin II is converted to angiotensin III after that to angiotensin IV. Angiotensin IV binds at AT_4 receptor sites, which are most predominant in the neocortex, hippocampus, and other areas and improves learning and memory [28].

Nonsteroidal Anti-inflammatory Drugs: Most researches on nonsteroidal anti-inflammatory drugs have concentrated on prevention instead of treatment of AD[29]. Animal models have exhibited that anti-inflammatory cyclooxygenase-2 (COX-2) inhibitors (Rofecoxib) reduced oxidative stress yet nonspecific COX inhibitors (Flurbiprofen and Ibuprofen) [30].

Secretase Inhibitors: Secretases are enzymes forms plaques by breaking APP of cell membranes into βA fragment. Memoquin, an example of β-secretase inhibitors reduce βA production by inhibiting AChE and limits tau hyperphosphorylation in early developmental stage [31].

Herbal Drug Treatment:

Polyphenols e.g. Resveratrol found in red wine, peanuts and other plants, has been used to reduce oxidative stress, inflammation, βA and protect DNA thus, decrease in cell death. A moderate utilization of red wine decreases the danger of growing AD [32].

Curcumin obtained from turmeric is used in AD treatment. Curcumin has neuroprotective, anti-inflammatory, antioxidant activities and cause inhibition of βA formation and clearance of existing βA [33].

Ashwagandha (also known as *Withania somnifera)* proposed to have neuroprotective, anti-inflammatory, antioxidant, AChE inhibitoy, βA inhibitory activities which decrease in cell death[34]. It has been found that its oral use reversed damage to hippocampus and brain cortex by diminishing neurite atrophy, restoring synapses and improving memory in mice ([35].

Nutrients and Hormones:

Alpha-lipoic acid acts as a prevailing micronutrient with various pharmacological and antioxidant properties[36]. LA has been proposed to have anti-dementia in AD by altering antioxidant protective enzymes[37].

Polyunsaturated fatty acids like omega 3-fatty

acids (FAs), docosahexaenoic acid (DHA) found in high levels in the mammalian brain, neuronal membranes and myelin sheath. Their actions were observed by enhanced receptor binding and function of ion channels[38]. The cognitive impairment occurs due to diminished serum DHA levels which obstruct learning and memory[39]. As a result, the scientists have explored possibility of DHA supplement utilization may decrease risk of progression of AD[40].

Vitamin B_{12} and folate in low levels are shown to result into cognitive decline. AD patients have high levels of homocysteine which need to become low. Homocysteine levels seem to relate with aging but not with cognition. A combination of vitamins B_{12} and B_6 and folate brought down homocysteine in people with mild to moderate AD[41].

Retinol commonly known as Vitamin A is essential for learning, memory and cognition. Vitamin A levels in the brain decline in AD people, therefore its need to improve. A metabolite of vitamin A, retinoic acid is known to slow cell death and protect from βA[42].

Lithium Compounds are prescribed for some neurodegenerative disorders. Enhancement of bcl-2 levels (neuroprotective protein) in hippocampus and frontal cortex of the rat has been observed. It also inhibits GSK-3, which is involved in increasing levels of phosphorylated tau and believed to be a factor prompting βA plaques and cell death [43].

Melatonin has antioxidant, anticancer properties and also protects mitochondria against tau tangles and also reduces βA toxic effects [44].

Conclusion

The evidences have been proposed to suggest that Aβ has pivotal role in the pathogenesis of AD, which involves many complex secondary events in the disease. Novel developments like radiology, chemistry and system biology involved use of biomarkers to identify mechanism. Enormous development has proposed to make various strategies for AD treatment including anti-inflammatory, antiamyloid, secretase inhibitor, antihypertensive, cholinesterase inhibitor, and some natural nutrients and hormones.

In this paper, authors have discussed the current research on diagnosis and pharmacotherapy of Alzheimer's disease which may be fruitful for researchers engaged in the experimental research.

Abbreviations: AD, Alzheimer's disease; ACh, acetylcholine; AChRs, acetylcholine receptors; AChEs, acetylcholinesterase; AChEIs, acetylcholinesterase inhibitor; ApoE, apolipoprotein-E; βA, beta amyloid; β-APP, β-amyloid precursor protein; NMDA, N-methyl d-aspartate.

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In Vitro Anticancer Study of Bioactive Compound Isolated from Musa Extract (Musa Acuminata)

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Abstract

Banana tree being one of the most economically important tree worldwide is cut once the fruits are harvested. However other parts of the tree are used in medicine worldwide. In this study, the flower extract of *Musa acuminata*is extracted by maceration with methanol and the phenolic and aliphatic compounds present in the flower extract is identified using GC-MS analysis. Phytochemical screening of the banana extract showed the presence of alkaloids, phlobatanning, triterpanoids, flavanoids, lipids, steroids and terpenoids. Potent antibacterial activity is observed from the flower extract against the tested gram positive and negative bacteria. Anticancer activity of the flower extract is assessed on the cervical cancer cell line HeLa. MTT assay is used to evaluate the antiproliferative effects. This study concluded that the economically important *Musa acuminata*is widely used in anticancer studies worldwide.

Keywords: *Musaacuminata, Phenolic compounds, GC-MS analysis, Phytochemical screening, Antibacterial activity, MTT assay.*

Introduction

Recently, *Musa sp*, (Musaceae) also known as Banana has evolved to be one of the largest herbaceous flowering plant recognized by the world. *Musa sp*, being a most popular fruit are widely exported to a number of industrialized countries [1]. Tropical and sub-tropical regions of the world consume more banana in common. Having south western pacific as native, banana is recognized as a tropical fruit.[2] Almost every part of banana plant has got its own significant use that is useful to mankind in many aspects. Being highly polymorphous *Musa acuminata* is spindly plants that are grown in clumps. Musa species is widely used in medicinal and traditional food. The optimum temperature for the growth of *Musa acuminata* is 80˚F (26.67□) and the optimum mean rainfall is 4 in (10 cm) per month.

Being under the kingdom Plantae and coming under the order Zingiberales it belongs to the family Musaceae having genus Musa has a wide range of sub species. It is a perennial monocotyledonous herb. Musa is an bisexual flower having each spathe encloses 2 rows of flowers, upper spathe enclosing male flowers, lower spathe enclosing female flowers, and few middle spathe with bisexual flowers. The flowers are tricarpellary, syncarpous, ovary inferior, placentation axile, style long, stigma capitated. [3] It takes approximately 28 days for *Musa acuminata* for anthesis, 2 to 3 weeks after plantation.

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It has high protective action and is widely used to prevent food spoilage. The blossoms of banana to a wide extent is considered as a vegetable and is cooked in various dishes [4]. It is helpful in muscle contraction and response of nerve cells. The banana also enables the stabilization of blood pressure. Being known for its eternal evergreen, Musa species, are widely used for ornamental purposes.

Musa species, highly known for its medicinal purposes is beneficial to mankind. Heart pain, asthma, endocrine problem like diabetes can be treated by the flowers of banana. Stomach cramps and diarrhoea can be treated by consuming banana leaves. Menses pain and bleeding due to menopause can be reduced by the uptake of banana leaves by women. Infantile malnutrition and weak body can be suppressed with the help of banana blossoms. Antioxidants are components that reduce the oxidative stress level by prevention of free radicals from damaging DNA, proteins and lipids. Being a weak primary antioxidant source, *Musa acuminata* has proven to be a powerful secondary antioxidant source[5]. Ascorbic acid, beta carotene, phenolic groups, dopamine are the antioxidant compounds found in *Musa acuminata*. Being a good source of bioactive phytochemicals *Musa acuminata* provide opportunities for functional food industry.

Methodology

Identification and Handling of Sample: Arid flowers of *Musa acuminata* were collected from Sathyamangalam forest. Using plastic bags, the flowers collected were transferred to lab. The powdered and sieved arid flowers are finely powered and is stored in the Non-toxic- polyethylene bag.

Plant Extract Preparation: 10 gm powder mass was extracted using 200 ml Methanol solvent. Dark maceration for 72 hours at 27˚C was considered for the extraction process and muslin cloth was used for filtration. The pasty layer of extract was formed after the filtrate was condensed at 45˚C which were used for further assays.

Phytochemical Screening:

Test for alkaloids: To 3 ml of the extract 1 ml of Mayer's reagent was added and shaken well, presence of Alkaloids was indicated by the white precipitate at the bottom.[12]

Test for phlobatannins: 10 ml of aqueous extract of flower was boiled with 1% HCl. Presence of phlobatannins was indicated by the thick red precipitate deposition in the bottom.[12]

Test for triterpenoids: Salkawasaki Test was used to indicate Triterpenoids in the extract in which 2 ml of extract was taken and 5 drops of concentrated sulphuric acid was added, shaken and allowed to stand. Presence of triterpenoids was indicated by the appearance of greenish blue colour.[12]

Test for flavonoids: Alkaline reagent was used to indicate the presence of flavanoids in the extract. To 1 ml of the extract few drops (3 drops) of 10%NaOH solution was added, flavonoids was indicated by intense yellow colour, which disappeared on addition of a few drops of dilute acid.[12]

Test for lipids: To 10 ml of the extract 0.5 N alcoholic potassium hydroxide was added along with a drop of phenolphthalein. The mixtures were heated on water bath for 1 hour. The presence of lipids was indicated by the formation of foam or soapy layer.[12]

Test for steroids: To 5 ml of aqueous extract 2 ml of chloroform and few drops of concentrated H_2SO_4 was added. The presence of steroids was indicated by the appearance of red colour in the upper layer while yellow with greenish fluorescence appears in the H_2SO_4 layer.[12]

Test for terpenoids: To 1 ml of the aqueous extract 1 ml of chloroform was added and mixed well and left for 5 minutes, 1ml concentrated H_2SO_4 was added after 5 minutes. The presence of terpenoids was indicated by the appearance of greyish layer.[12]

Antioxidant Assay: The antioxidant capacity of *Musa acuminata* was identified through 2,2-Diphenyl-1-picryhydrazyl (DPPH) assay. Equal volumes samples at different concentrations were with 0.1 mM of DPPH. Then the mixture was stored in dark place for 30 minutes. The colour change from violet to yellow indicated the presence of antioxidants. Quantification was calculated by absorbance. The absorbance was performed in triplicates. Ascorbic acid was used as the standard to compare with samples and IC50 (inhibition concentration) was calculated for both sample and standard. The percentage of inhibition was calculated using the following formula.

$$\% \text{ of inhibition} = [A_0\text{-}A_1/A_0] \times 100$$

Where A_0 is absorbance of control (i.e., DPPH solution without sample) and A_1 is absorbance of sample or standard (i.e., DPPH solution with sample/ standard)[12]

GC-MS: The sample was subjected to GC-MS analysis to quantify the number of molecules and its structures. The analysis was carried out using GCMS (Perkin Elmer model: Clarus 680) and also it is equipped with mass spectrometer (Clarus 600(EI) analysed using (TurboMassver5.4.2) software. Fused silica which is packed with Elite-5MS. At a constant flow rate about 1 ml/min, carrier gas such as helium was used to separate the components. The temperature of the injector was adjusted to 260˚C while performing the experiment. The extract sample of 1µL was injected was into the equipment the temperature of the oven were 60˚C(2mins); followed by 300˚C at the rate of $10^{\circ}Cmin^{-1}$; and 300˚C for 6 mins. The conditions of the mass detector were: the temperature of transfer line was 240˚C: and ionization mode electron impact at 70 eV, the duration time of scan interval is 0.2 sec and scan interval is 0.1 sec. The fragments from 40 to 600 Da. The spectrum of components was corresponding to the database of the spectrum of established components gathered in the GC-MS NIST library.

Antibacterial Assay: Antibacterial activity was determined by agar well-diffusion method. Swabbing using sterile cotton swabs was done on Nutrient agar (NA) plates with 8 hour old-broth culture of different bacteria such as *Streptococcus agalactiae, Bacillus cereus, Staphylococcus aureus, Enterobacteraerogenes, Eschericia coli, Bacillus subtilis*. In each of these plates wells (10 mm diameter and about 2 cm a part) were made using sterile gel puncher. From the methanolic flower extract 1 mg/ml concentration of stock solution was prepared.30 µl of varying concentrations of flower solvent extracts were added by sterile micropipette into the wells and allowed to diffuse at room temperature for 2 hrs. Inoculums without plant extract were set up for control experiments. Incubation of the plates is done at 37˚C for 18-24 h for bacterial pathogen. The zone of inhibition was observed and the diameter of the inhibition zone (mm) was measured and the experiment was also calculated. Triplicates were maintained and the experiment was repeated thrice, for each replicates the readings were taken in three different and the average values were recorded.

Cytotoxic assay (MTT method): The sample was performed with an in vitro Cytotoxicity test method. The culture medium from the Hela cells was replaced with fresh medium. The triplicates of the test sample were added on the cells. Incubation at 37°C for 18 hr was done. After incubation MTT (1 mg/ml) were added in the wells and incubation was done for 4 h. DMSO were added in the wells after incubation and read at 570 nm using photometer. Cytotoxicity and cell viability were calculated by

$$\text{Cytotoxicity} = [(\text{Control-Treated})/\text{Control}]\times 100$$

$$\text{Cell Viability} = (\text{Treated}/\text{Control})\times 100$$

Result and Discussion

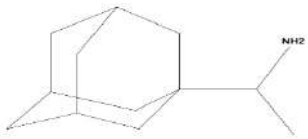
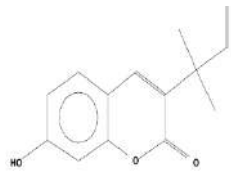
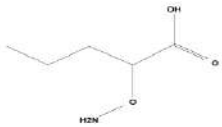
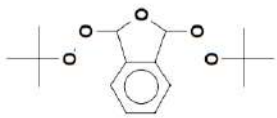
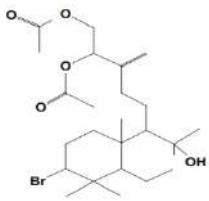
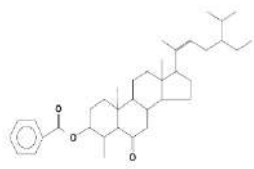
The chemical composition of the extract was studied using GC-MS analysis. The peak was identified as pentanoic acid, 2-(aminooxy)- an aromatic phenolic group of salicylic acid at a retention time of 26.508. The next compound was identified as 1,3-bis-t-butylperoxy-phthalan belonging to aromatic phenolic group of salicylic acid giving a peak at 27.663 retention time. The next peak was observed at 29.364 retention time which was identified as 1,2-pentanediol, 5-(6-bromodecahydro-2-hydroxy-2,5,5a,8a-tetramethyl-1-naphthalenyl)-3-methylene that belongs to the aromatic phenolic groups of salicylic acid. The final peak was observed at 29.544 retention time and the compound was identified as carpesterol dehydrate an aromatic phenolic group of salicylic acid compound.[6] The GCMS analysis result for major phytocomponents in*Musa acuminata* flower is given in Table 1. Chromatogram of compounds present in *Musa acuminata*is represented in Figure 1.

The crude extract of *Musa acuminata* was obtained from maceration with 80% methanol. Antibacterial assay of the flower extract against gram positive and negative bacteria were determined by the formation of zone of inhibition around the wells. The negative control (methanol) showed zero zone of inhibition. Larger zones of inhibition were observed on the plates with 20 µg/ml of Ampicillin (antibiotic) to the methanolic extract tested. The zone of inhibition of *S.aureus* shows greater diameter of 10mm over the flower extract while the zone of inhibition of other bacterial strains ranges from 5mm to 8mm. The antibacterial activity that is the formation of the zone of inhibition in the agar well diffusion method is due to the presence of active compounds in the flower extract.[7-12]Different Bacteria and its zone of inhibition is tabulated in Table 2.The phytochemical constituents of *Musa acuminata*flower extract is tabulated in Table 3.

The MTT assay resulted in the sample showed Slight to Severe Cytotoxic reactivity to Hela cells. The cell death was increased with increase in concentration on the sample. Another experimental study of anthocyanin extracted from *Musa acuminata* bract showed a strong anticancer activity against of MCF-7 cell lines(Breast cancer)[13-15]. Another experimental result tested against carcinoma of cervix (HeLa) showed increased effect on a dose-dependent manner against the extracts from rhizome of *Musa acuminata*.[16-17] The control gave no cytotoxic reactivity.The activity of sample at different concentrations against the cells are displayed in Figure 2, the cytotoxicity is represented in Figure 3 and the cytotoxic reactivity of *Musa acuminata* flower extract displayed in Table 4.

Table 1: GCMS analysis result for major phytocomponentsinMusaacuminata flower

(RT- Retention Time)

RT	Compound Name	Molecular Formula	Molecular Weight	Peak Area	Molecular Structure
25.933	1-adamantanemethylamine, alpha.-methyl-	$C_{12}H_{21}N$	179	3.555	
26.108	7-hydroxy-3-(1,1-dimethylprop-2-enyl)coumarin	$C_{14}H_{14}O_3$	230	4.025	
26.508	pentanoic acid, 2-(aminooxy)-	$C_5H_{11}O_3N$	133	10.832	
27.663	1,3-bis-t-butylperoxy-phthalan	$C_{16}H_{24}O_5$	296	5.798	
29.364	1,2-pentanediol, 5-(6-bromodecahydro-2-hydroxy-2,5,5a,8a-tetramethyl-1-naphthalenyl)-3-methylene	$C_{24}H_{39}O_5Br$	486	18.411	
29.544	Carpesterol Dehydrate	$C_{37}H_{52}O_3$	544	57.378	

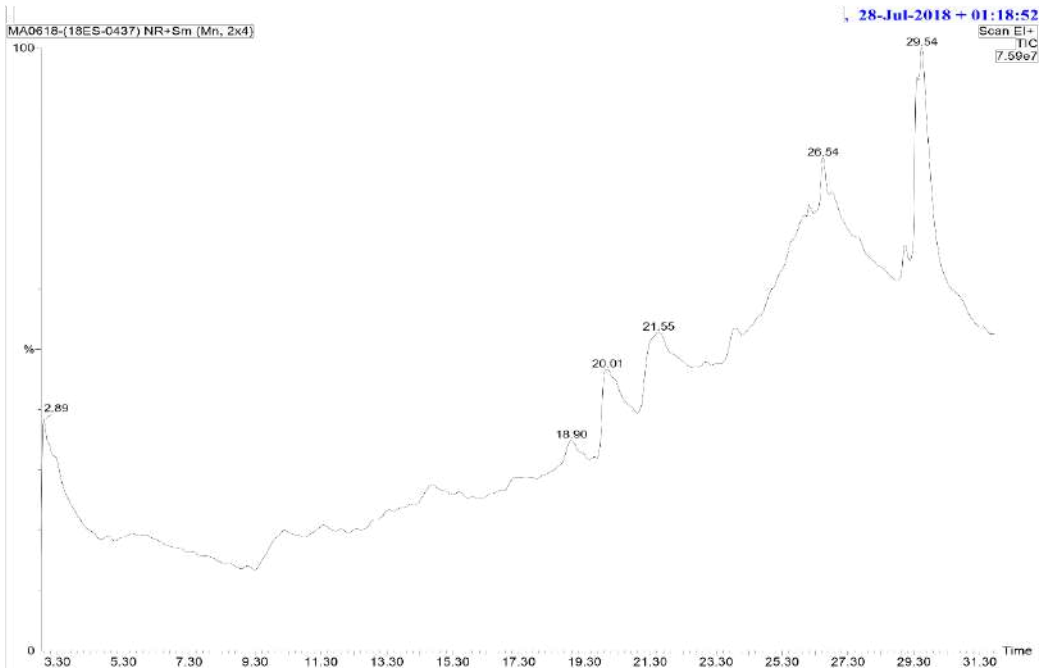


Figure 1: Chromatogram of compounds present in Musa acuminata

Table 2: Different Bacteria and its zone of inhibition

Microorganism	Zone of Inhibition in Extracts (mm)	Zone of Inhibition in Ampicillin (mm)
Streptococcus agalactiae	6	8
Bacillus cereus	5.4	7.1
Staphylococcus aureus	10	12
Enterobacteraerogenes	7	8.1
Eschericia coli	6.6	7.9
Bacillus subtilis	8	9

Table 3:The phytochemical constituents of Musa acuminataflower extract

Phytochemicalconstituents	Presence
Alkaloids	+
Phlobatannins	+
Triterpenoids	+
Flavonoids	+
Lipids	+
Steroids	+
Terpenoids	+

(+ present)

Table 4: Cytotoxic reactivity of Musa acuminata flower extract

Vol (µl)	Cytotoxicity (%)	Cell Viability (%)	Cytotoxic Reactivity
5	16.2	83.8	Slight
25	22.8	72.8	Mild
50	33.2	66.8	Mild
75	59.5	40.5	Moderate
100	71.9	28.1	Severe

Figure 2: Hela cells reactions at different sample concentrations.

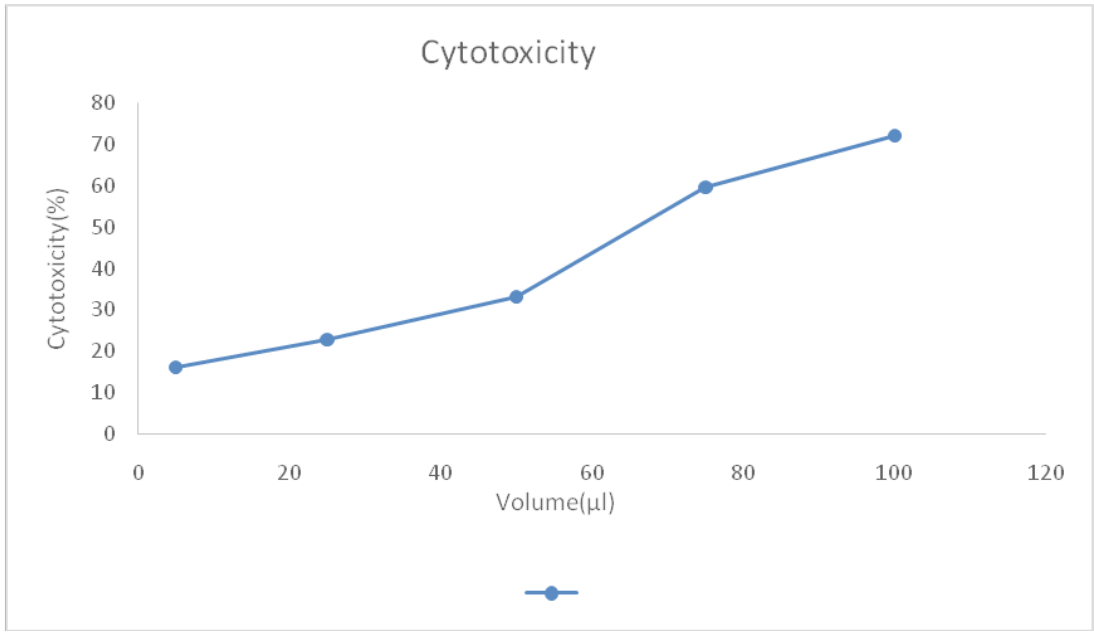


Figure 3: Cell death percentage of Hela cells against Musa acuminata

Conclusion

This study shows us the compounds present in *Musa acuminata*. *Musa acuminata* is rich in phenolic compounds as per this study. Phytochemical study of the extract revealed the presence of certain group of compounds. *Musa acuminata* acts as good antimicrobial agent since it shows a significant inhibition zone against some bacteria. Further Musa extracts acts as good antioxidant sources. Musa extracts are also involved in anticancer studies in medicinal field.

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Optimized Feature Selection and Classification in Microarray Gene Expression Cancer Data

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Abstract

Cancer classification can be performed by Microarray Gene Expression data which comprises of thousands of genes and small number of samples. Gene expression data is efficient method for finding which gene causes cancer in human being. In this work, formulate hybrid model containing filter approach, the wrapper approach and partial least square method that used to select the optimized features form the high dimensional dataset. Filter approach uses mutual information, wrapper approach uses genetic algorithm and partial least square method uses t-score estimation for feature selection mechanism. With the reduced dimension of features, classification is performed on the reduced data set to classify the samples into normal or abnormal. To attain the improved classification accuracy both the feature selection and the dimension reduction is performed. By using feature selection technique most possibly cancer related genes from huge microarray gene expression data are selected. The trained classifier model is tested with benchmark cancer dataset which consists of colon cancer dataset comprises 62 samples, 40 of which are tumor and 22 are normal with 2000 genes and the prostate cancer dataset comprises 136 samples, 59 of which is normal and 75 are tumor with 12,600 genes. The proposed model achieves accuracy of 92.7% for wrapper approach with optimal features and also outperforms other two approaches with respect to accuracy and time complexity.

Keywords: *Partial least squares, Feature selection, Mutual Information, Cancer classification, t-score, genetic Algorithm, Support vector machine.*

Introduction

In Human being, Gene expression is the process by which information from a gene is used in the synthesis of a functional gene product. Measuring gene expression is an important part of many life sciences, as the ability to quantify the level at which a particular gene is expressed within a cell, organism or tissue can provide a lot of valuable information. Gene expression profiles based on microarray data are recognized as potential diagnostic indices of cancer.

Feature selection used for microarray gene expression data is called gene selection. Apart from curse of dimensionality there are many other problems faced during gene selection for prediction or classification. The major problems are mislabeled or redundant or noisy data, problem of cross-platform comparisons, bias problem and difficulty in biological information retrieval.

Major feature selection algorithms are the filter model, the wrapper model and partial least square method. The filter model approach depends on general characteristics of the training data to select some features/genes without involving any learning algorithm, therefore it does not inherit any bias of learning algorithm. The wrapper model approach requires one predetermined learning algorithm in feature selection and uses its performance to evaluate and determine which features are selected. As for each new subset of features, the wrapper model needs to learn a hypothesis (or a classifier). It tends to give superior performance as it finds features better suited to the predetermined learning algorithm, but it also tend to be more computationally expensive.

Partial least squares (PLS) technique is another dimension reduction method that is used widely for the gene expression data based cancer classification. PLS is the best method to handle the high-dimension-small-sample-size problem. This kind of problem can be well

handled with partial least squares method and with the t-scores calculated for the feature selection is also used for dimension reduction.

To combine the advantages of above approaches, algorithms in a hybrid model have recently been proposed to deal with high dimensional data. In these algorithms, first, a goodness measure of feature subsets based on data characteristics is used to choose best subsets for a given cardinality and then cross validation was exploited to decide a final best subset across different cardinalities. These algorithms mainly focus on combining filter and wrapper algorithms along with partial least square to achieve best possible performance with a particular learning algorithm at the same time complexity of computational algorithms.

In this work proposes a new filter-based feature selection method uses mutual information (MI) to evaluate the dependence between features and output classes. The most relevant features are retained and used to construct classifiers for respective classes.

In the second method, the selection and classification of gene subsets is performed, the selection is performed by a genetic algorithm, and the classification of the subsets feature is made with a support vector machine and is validated using a cross-validation method.

In the third method, Partial least squares technique uses t-score estimation for dimension reduction in the gene expression data. In this technique, T-scores of the genes are calculated and the individual genes satisfying a particular threshold value will be made into a subset of genes that contributes to the classification. This subset is provided as the input for the dimension reduction that further reduces the dimension of the genes. The reduced subset of data is given to classifier for identifying the cancer and non-cancer samples.

The paper is organized as follows. In section II, we present the related work to our proposed system, In Section III, the materials and method. Results and performance evaluation of the work are provided in Section IV. Finally section V concludes the proposed work.

Related Work: Feature selection is a technique for eliminating irrelevant and redundant features and selecting the most optimal subset of features that produce a better characterization of patterns belonging to different classes.

Forward feature selection algorithm[1] using the mutual information method to measure the relation among features. The optimal feature set given to train the LS-SVM classifier and results good accuracy.

E Alba et al., proposed the hybridization of Particle Swarm Optimization, a Genetic Algorithm and the Support Vector Machine (PSO/GA/SVM) to find few genes with high classification rates[2]. In order to overcome the local optimum problem in GA,it is combined with PSO and SVM to find a better optimal solution.

Correlation-based Feature Subset Selection (CRFS) approach[3] in which two correlation measures are used for feature selection ie., feature-class correlation and feature-feature correlation. Initially, N numbers of features are combined as possible combinations of feature subsets using heuristic-based best-first search, then each subset is evaluated with the two correlation measures. The subset that has lesser feature-feature correlation and higher feature-class correlation compared to other feature subsets is considered as the selected significant feature subset for the classification task.

Mutual Information-based Feature Selection (MIFS) method[4] is used to determine the relevancy between the individual feature and the target-class. The features having similar information are considered as redundant features that are to be removed and this method shows good accuracy results.

Particle swarm optimization (PSO)-based feature selection method[5], in which the feature subsets generated by PSO are evaluated using supervised learning algorithm and results good accuracy.

Mutual information-based max-relevancy min-redundancy (MRMR) feature selection[6],the mutual information is computed between the individual feature and target-class, and to identify the redundant feature, the mutually exclusive condition is applied to get good accuracy.

Conditional mutual info maximization (CMIM)[7] method that recursively chooses the features that have maximum mutual information with the target-class for classification.

Materials and Method

This section provides the description of the proposed system. The system design is shown in Fig. 1. The framework contains three main components. The modules are described here.

Dataset: The genomics dataset[8] are collected from publicly available website which consists of colon and prostrate cancer data.

Some of the gene names included in the 2000 genes that provides the expression levels are H55933, R85482 X63432, L28809, J02763, T63508, U14973

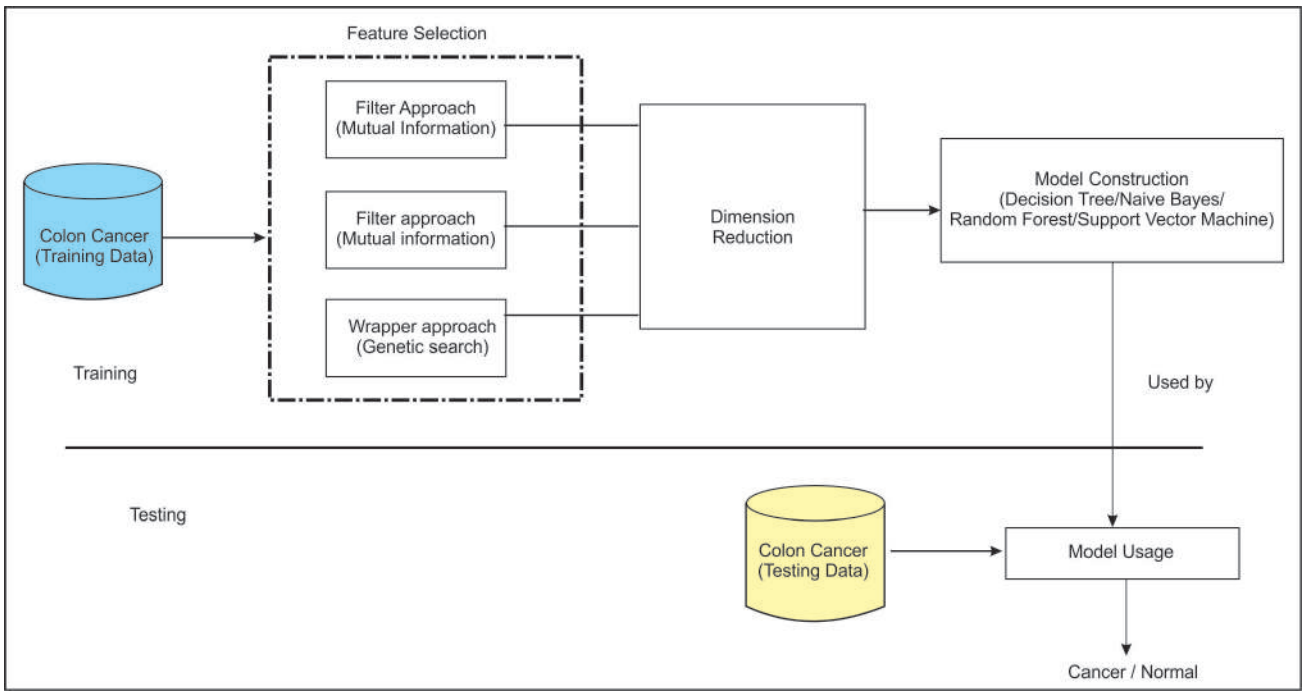

Figure 1: Overall System Design

Mutual Information: In feature selection, a feature is relevant to the class if it contains important information about the class; otherwise it is irrelevant or redundant. Since mutual information is good at quantifying the amount of information shared between two random variables, it is often used as a criterion to evaluate the relevance between a feature and a class label.

Under this context, features with high predictive power are the ones that have larger mutual information I(C; f). On the contrary, in the case of I(C; f) equal to zero, the feature f and the Class C are proven to be independent of each other. This means that feature f contributes redundancy to the classification.

Mutual information is a symmetric measure of the relationship between two random variables.

$$I(f,C) = H(f) + H(C) - H(f,C) \quad (1)$$

where, H(f) and H(C) are the entropies of f and C

Procedure:

Input: Feature set F = $\{f_i, i = 1, \ldots, n\} \in D$

Output: S //Selected feature subset

Step 1: Initialize set S = $\varnothing$

Step 2: Calculate amount of information for each feature f_i with respect to the class

Step 3: Select the feature f_i which has the maximum mutual information.

Step 4: Add the feature f_i to the set S

Genetic search: A genetic algorithm is a type of local search method. It mimics evolution by taking a population of strings, which encode possible solutions, and combines them based on fitness function to produce individuals that more fit.

There are five phases Initial population, Fitness Function, Selection, Cross over, Mutation

Procedure:

Step 1: Encoding of the problem in a binary string

Step 2: Random generation of a population

Step 3: Calculate fitness of each solution

Step 4: Select pairs of parent strings based on fitness

Step 5: Generate new string with crossover and mutation until a new population has been produced.

Repeat step 2 to 5 until satisfying solution is obtained

T-score feature selection: Gene selection is the initial process of preselecting the genes by finding the score. The score is calculated for each gene by using the mean, variance and number of samples. Calculating the t-score provides the information about the informative genes and also about the irrelevant genes.

Steps:

1. Initially split the dataset according to their class labels.
2. Calculate mean $\bar{x}$, variance s_k^2 and also number of samples in each class N_k.
3. Calculate the t-statistics score for each gene and the formula is given as

$$t = \frac{\overline{x_0} - \overline{x_1}}{\sqrt{\frac{s_0^2}{N_0} + \frac{s_1^2}{N_1}}}$$

Where k = 0, 1 that represents the various classes. For each gene t-score value is calculated and the results are provided using the t-score value about eliminating the irrelevant genes and identifying the informative genes. Therefore the feature selection method is for calculating the score and identifying the best scored features. With the best scores subset of features is formed.

Dimension Reduction

Dimension reduction plays an important role in analyzing the suitable subset of data that helps in handling the data in a batter way. Reducing the features alone doesn't provide the better classification results but also in the formation of informative subset of original data. PLS calculates the covariance between the predictor variables and the response variables. Higher the covariance between the predictor variables higher the amount of information provided by the features. The formula for calculating the covariance and reducing the dimension is provided.

$$w1 = \arg\max(\mathrm{Cov}(Xw, y))$$

The objective function is provided above and using the covariance it is calculated.

Classification

Input: S // Selected feature subset,

Output: Class labels

Various classifiers such as SVM, Decision tree C4.5, Naïve Bayes are used for the identification of unknown class labels.

Results and Discussions

This part discusses the results of the each component of the system and provides the performance evaluation of the implemented methodologies.

Feature Selection:

1. Mutual Information:

Table I: Filter approach based on mutual information

Index	Attribute Index	Mutual Information
1	249	0.348689
2	1042	0.344656
3	258	0.329303
4	399	0.293341
5	493	0.283547
6	513	0.283547
7	1771	0.283547
8	377	0.232417
9	1772	0.232417
.....	.....	.....
200	1567	0.86545

Table I shows the results of selected features (Top 200) by using mutual information based feature selection method.

Table II shows the results that comparing them with various classifier such as decision tree, Naïve bayes and Random forest with the accuracy of the feature selected by the filter approach.

Table II: Classification for filter approach

Classifier	Training set	Testing set	Accuracy
Decision tree (C4.5)	75	25	86.3871
	60	40	84
	40	60	75.6757
	80	20	87.09677
Naive Bayes	75	25	87.0968
	60	40	64
	40	60	70.2703
	80	20	91.67
Random forest	75	25	98.3871
	60	40	72
	40	60	70.2703
	80	20	91.667

2. **Genetic Approach:** Genetic Algorithm combined with decision tree, in order to select a small subset of genes ie., 8 features that allows enhancing the classification accuracy of 92.70%

Table III: T-Score Values

Gene Names	T-Score Value
H55933	0.005846
H54676	0.015935
X55715	0.051163
D45887	-0.0123282
T57882	0.042118
R50864	0.033315
X02152	0.024249
U20982	-0.017666
X66363	0.012090
M86842	0.015174

3. **T-Score Feature Selection:** Genes are selected using the T-score value for each gene. Using the T-score value calculated for each gene present in the data particular number of informative genes can be identified and also irrelevant genes can be identified. The calculated T-score value is shown in Table III.

Dimension Reduction

Dimension Reduction is done after the feature selection method is performed. Using the t-statistics value the features are selected from the large number of genes. Informative genes can be identified using the high t-score value and the irrelevant genes can be identified by the low t-score value. PLS method is used for the dimension reduction and the dimension is reduced using the covariance value calculated between the predictor variables.

Performance Analysis and Evaluation: The performance analysis is done by calculating the accuracy.

$$\text{Accuracy } a = \frac{tp + tn}{tp + tn + fp + fn}$$

The table IV shows the performance analysis of various classifiers performed on colon cancer and prostate cancer dataset. Here method adopted for feature selection and dimensionality reduction is partial least square (t-score calculation).

Table IV: Performance analysis

Classifier	Accuracy for colon cancer	Accuracy for prostate cancer
SVM	93.5%	92.8%
Decision Tree	91.25%	90.6%
Naïve Bayes	88.5%	87.2%
Random Forest	92.4%	94.2 %

The Accuracy value for Filter approach, Wrapper approach and T-score estimation is shown in table V.

Table V: Comparison of Filter, Wrapper and PLS approach

Method	Important Features Selected	Number of Features	Accuracy (%) (C4.5)
Mutual information (Filter approach)	N1=249, 1042, 258, 399, 493, 513, 1771,, ...1567	200	87.09677
Genetic algorithm (Wrapper approach)	N2=51, 575, 633, 870, 1244, 1310, 1742, 1952	8	92.70968
T-score Estimation (Partial Least Square)	-	100	91.25

Conclusion and Future Work

The proposed work uses a hybrid technique which uses filter based approach, Wrapper based method, Partial least square method. Classification is performed on reduced gene subsets and is validated using a cross-validation method.

Although the proposed MIFS (Mutual information based feature selection) has shown encouraging performance, it could be further enhanced by optimising the search strategy .In this work, wrapper approach outperforms other two approaches. In future research the combination of other techniques of feature selection will be used, as other local search method (Ant Colony Optimization, Particle Swarm Optimization) or other techniques of data mining, the goal is to maximize the classification accuracy and minimize the number of genes for further analysis.

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Conflict of Interest: Nil

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Ethical Clearance: No Human or Animal Subject is involved in this research.

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Evaluation of Autonomic Dysfunction in Underweight, Normal Weight, Overweight and Obese Patients with Chronic Obstructive Pulmonary Disease

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Abstract

Background: Though there are several studies available on effects of obesity on cardiac autonomic dysfunction and effects of COPD on cardiac autonomic dysfunction separately but search on combined effect of obesity and COPD on cardiac autonomic dysfunction fails to produce results. Therefore there was a need to evaluate the changes in autonomic dysfunction with increasing BMI in patients with COPD.

Objective: The aims of this study were 1) to compare autonomic dysfunction in patients with COPD with increasing BMI, 2) to correlate autonomic dysfunction in patients with COPD with increasing BMI.

Methodology: In the present study, 42 subjects were categorized into underweight, normal weight, overweight and obese category. Non invasive cardiac autonomic function tests were carried out in these subjects.

Results: The mean ± SD age of underweight, normal weight, overweight, and obese patients with COPD were 57.667 ± 5.1640, 61.007 ±8.8991, 55.800±6.6106 and 56.200±7.1204 respectively. It was found that there was no correlation between BMI and autonomic dysfunction responses in patients with COPD. All four cardiac autonomic function test came out to be non significant statistically [Karl Pearson correlation (r), ns- p >0.05]. Multiple comparisons between underweight, normal weight, overweight, and obese patients with COPD for cardiac autonomic responses, FEV_1, PEF were statistically non significant.

Conclusion: In present study, although the results have shown that there was definite autonomic neuropathy in patients with COPD with increasing BMI, there was no significant difference in autonomic dysfunction with increasing BMI in patients with COPD.

Keywords: *Forced expiratory volume (FEV_1), Peak expiratory flow rate (PEF), Obesity, Chronic Obstructive Pulmonary Disease.*

Introduction

The chronic obstructive pulmonary disease (COPD) is characterized by persistent airflow limitation that is usually progressive and associated with an enhanced chronic inflammation response of the airways. It has been estimated that in 2030, COPD will become the third biggest cause of death.[1,2]

Previous studies show that in COPD patients, cardiovascular autonomic neuropathy (CAN) is a common consequence and has been shown to negatively affect the cardiovascular and autonomic nervous system.[3, 4] Previous studies have demonstrated that COPD patients have depressed heart rate variability (HRV), indicating increased sympathetic activity at rest[5,6] and Bronchoconstriction, hypoxia, hypercapnia, weight loss and systemic inflammation are other associated features.[7, 8] Studies on adults show that the HRV is decreased in overweight young adults especially men indicating sympathovagal imbalance. No changes were

observed in HRV in underweight group. Changes in the autonomic nervous activity begin in the overweight and may become more prominent in the obese thus indicating increased cardiovascular risk. [9] But the number of studies that analysed the autonomic functions in obese adult population is still limited.

Available data suggests that obesity is more prevalent in patients with COPD than in the general population, depending on the severity of chronic airflow limitation. [10, 11] Obesity is an independent risk factor for cardiovascular disease and mortality[12,15.] Autonomic neuropathy is another complication in obese patients.[16,17] But limited literature is available to examine the relation between increasing body mass index (BMI) and cardiac autonomic function tests in patients with COPD. Hence, this study on the evaluation and correlation of autonomic function in the underweight, normal weight, overweight and obese patients with COPD was undertaken

Materials and Method

Subjects: 42 COPD subjects on the basis of BMI were categorized into 6 underweight, 26 normal weight,5 overweight and 5 obese category. Written informed consent was taken from the subjects and approval was obtained from the Institutional ethical committee. Procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national).

Parameters Measured: Autonomic function tests were employed to evaluate the integrity of both parasympathetic and sympathetic innervations of the heart in all the groups.

(A) Parasympathetic Function Tests: Blood pressure was recorded from OMERON digital sphygmomanometer and heart rate beat to beat changes can be measured from a continuous running ECG record (lead II).

1. Valsalva maneuver: The heart rate response to valsalva maneuver i.e forced expiration against resistance to assess baroreceptor integrity was assessed. The valsalva ratio was calculated as the ratio of longest R-R interval after maneuver to shortest R-R interval during maneuver. [16]

2. Heart rate variation (HRV) with respiration was measured in supine position. Resting ECG was recorded and baseline heart rate was measured. The subject was asked to breathe in deeply at a rate of 6 breaths per minute allowing 5 seconds each of inspiration and expiration. The expiratory (E) to inspiratory (I) ratio was calculated as the sum of 6 longest R-R interval, divided by 6 shortest R-R intervals. [16]

B. Sympathetic function tests:

1. **Cold pressor test (CPT):** Subject was asked to immerse his hand in cold water maintained at 4-6 degree Celsius and blood pressure measurement was made from other arm. Failure of systolic BP to rise by 16-20 mm Hg and diastolic BP by 12-15 mmHg was indication of autonomic neuropathy.[16, 17]

2. **Blood pressure response to standing:** After blood pressure measurement in supine position the subject was made to stand. Blood pressure was recorded in 30 second interval. Difference between readings of blood pressure in lying position and then after standing was calculated.[16,17]

Statistical Analysis: SPSS 21.0 software and graph pad prism 3.0 for windows were used. Co-efficient of correlation in bivariate relationship was obtained using the Karl Pearson correlation test. The autonomic responses were compared between underweight, normal weight, overweight and obese COPD using the multiple analysis of variance (MANOVA Tukey). A "p" value of <0.005 was considered as statistically significant.

Result

Table 1: Frequency of different responses to tests of autonomic dysfunction according to severity of COPD

Test	Under Weight N=6	Normal Weight N=26	Over Weight N= 5	Obese N=5
Valsalva ratio <1.20- abnormal, 1.20-1.45, borderline, and >1.45-normal				
Abnormal	2(33%)	8(31%)	3(60%)	1(20%)
Borderline	1(17%)	11(42%)	2(40%)	3(60%)
Normal	3(50%)	7(27%)	0(0)	1(20%)

Test	Under Weight N=6	Normal Weight N=26	Over Weight N= 5	Obese N=5
Heart rate variation (HRV) after deep breathing <10 beats- abnormal, 10-15 beats –borderline, and >15 beats –normal				
Abnormal	6(100%)	10(38%)	3(60%)	3(60%)
Borderline	0	11(42%)	1(20%)	2(20%)
Normal	0	5(19%)	1(20%)	0
BP response to posture change				
Abnormal	1(17%)	1(4%)	0	0
Borderline	2(33%)	8(30%)	2(40%)	0
Normal	3(60%)	17(67%)	3(60)	5 (100%)
BP response to Cold pressor test				
Abnormal	3(50%)	18(70%)	3(60%)	18(70%)
Normal	3(50%)	8(30%)	2(40%)	8(30%)

Table 2: Correlation between BMI and autonomic tests responses

	BMI		
	Pearson Correlation	**P Value**	**Significance**
Valsalva Maneuver	-.17	.28	NS
Heart rate variation after deep breathing	-.05	.75	NS
FEV1	.01	.97	NS
PEF	.19	.23	NS
SBP to posture change	-.25	.12	NS
DBP to posture change	-.08	.61	NS
SBP to cold pressor test	-.02	.90	NS
DBP to cold pressor test	-.08	.60	NS

SBP- Systolic blood pressure, DBP- Diastolic blood pressure, FEV_1- Forced expiratory volume in 1 second, PEF-Peak expiratory flow rate. There were no correlation between BMI and autonomic dysfunction responses in patients with COPD. [Karl Pearson correlation (r), ns- p >0.05] given in Table 2.

Table 3: Between groups MANOVA analysis

Group		Mean	Std. Deviation	F value	P Value
Valsalva Maneuver	1	1.3427	.38015	0.572	0.637
	2	1.2440	.12442		
	3	1.1580	.06058		
	4	1.3533	.20906		
Heart rate variation after deep breathing	1	12.846	7.8470	1.46	0.24
	2	8.600	4.0373		
	3	11.800	7.3959		
	4	6.950	2.1107		
FEV_1	1	37.62	10.534	0.599	0.62
	2	40.60	13.939		
	3	44.00	13.435		
	4	43.17	18.192		

Group		Mean	Std. Deviation	F value	P Value
PEF	1	34.50	12.791	1.039	0.386
	2	45.60	16.319		
	3	40.00	9.055		
	4	40.33	21.528		
SBP to posture change	1	9.54	7.223	0.316	0.814
	2	6.60	2.408		
	3	8.60	5.550		
	4	10.17	8.010		
DBP to posture change	1	5.69	4.028	0.451	0.718
	2	4.40	2.881		
	3	6.80	7.791		
	4	8.33	12.258		
SBP to cold pressor test	1	12.50	9.378	0.275	0.843
	2	15.00	9.618		
	3	15.80	6.979		
	4	15.17	13.630		
DBP to cold pressor test	1	7.15	5.548	0.177	0.911
	2	5.80	2.775		
	3	5.80	3.271		
	4	6.67	4.676		

Multiple comparisons between underweight, normal weight, overweight, and obese patients with COPD for cardiac autonomic responses. FEV_1, PEF were statistically non-significant (MANOVA Tukey, P>0.05) given in table-3.

Discussion

The role of BMI in the pathogenesis of COPD is not clear. In previous researches it has been found that both, parasympathetic as well as sympathetic divisions have been found to be affected in the adult obese population as compared to the non- obese adult population.[16,17] Whereas Chabra S K et al reported a reduction in both parasympathetic and sympathetic function in subjects with normal BMI with or without hypoxemia.[4] Among patients 21.4% had no evidence of autonomic neuropathy while 28.6% had early neuropathy and 28% had definite neuropathy. The relationship between autonomic neuropathy and BMI was not given by Chabra S K et al. The results of the present study found that there was definite autonomic neuropathy in normal weight COPD population similar to Chhabra S K et al. Amongst all the groups of COPD population in our study 90% have definite or early autonomic neuropathy and 10% have no evidence of autonomic neuropathy (Table-1).

Wu J et al compared autonomic dysfunction in underweight, normal weight, overweight and obese adults. The study compared HRV (hear rate variation during forced breathing) and HF (high frequency spectrum) power and correlated SDNN (the standard deviation of the average NN intervals) autonomic dysfunction in underweight, normal weight, overweight and obese adults. HRV and HF power were statistically significant for obese (p=o.o1) but there were non-significant results for underweight and overweight (P= 0.86, 0.15 respectively). There was no significant independent correlation of SDNN with underweight (p=0.41), overweight (p =0.80) and obesity (p= 0.43) group. It was concluded that underweight was not a correlate of any indices of Cardiac autonomic function (CAF) but over weight and obesity were independently associated factors of altered CAF.[18]

In our present study, we compared autonomic dysfunction in underweight, normal weight, overweight and obese COPD population. Parasympathetic function tests were statistically non- significant between underweight, normal weight, overweight, and obese COPD patients (P-0.64, P-0.24 respectively, table-3). Sympathetic function tests i.e BP response to postural change and BP response to cold pressor tests also were

statistically non-significant between underweight, normal weight, overweight and obese COPD patients. (P-0.8, P-0.84, table-4). We also found non- significant correlation between BMI and autonomic function tests (table-2)

In present study most of the underweight COPD population have definite or borderline autonomic neuropathy (table-1) which was different from the results of study of W u J et al. [18] This may be the reason that COPD patients have enhanced sympathetic tone at rest and are less able to respond to sympathetic and parasympathetic stimuli in comparison to healthy persons. Previous study show that resting muscle sympathetic nerve activity is significantly higher in patients with COPD as compared to age and sex matched healthy control subjects. [11]

Studies show that plasma nor-epinephrine was elevated in patients with emphysema compared with healthy controls. Altered lung inflation reflexes may also mediate sympathetic activation in COPD.[19,20] Sympathetic activation with its chronotropic effects may be responsible for elevated heart rate response seen in COPD patients.[20]

In underweight COPD patients, neuro-humoral activation caused by sympathetic activation may be a cause of skeletal muscle dysfunction. This seems to involve the diaphragm and accessory respiratory muscles, with aggravation of ventilation disturbances characteristic for COPD. Chronic hypoxemia seems to play a role in sympathetic activation, even in healthy subjects.[21]

The results of this study show that there was non-significant (weak positive, r-0.006) correlation for FEV_1 and PEF with increasing BMI [FEV_1(P-0.62, P-0.97), PEF(P-0.39,P-0.23) respectively, table-2]. Lad U et al found in their study that there was positive correlation in underweight male and female with FEV_1 and overweight male, and female had negative correlation with FEV_1.[21]

Conclusion

There were several studies available on effects of obesity on cardiac autonomic dysfunction and effects of COPD on cardiac autonomic dysfunction. But till date no study is available on combined effects of obesity and COPD on cardiac autonomic dysfunction. Therefore present study was done on evaluation of autonomic dysfunction with increasing BMI in patients with COPD. In present study, although the results have shown that there was definite autonomic neuropathy in patients with COPD with increasing BMI, there was no significant difference in autonomic dysfunction with increasing BMI in patients with COPD. Furthermore, in several studies we found that irrespective of the stages of the disease, underweight was an independent risk factor for cardiovascular complication and mortality. In mild and moderate COPD the best prognosis is found in normal weight or over weight subjects. In severe COPD, over weight, and obesity, is associated with better survival (obesity paradox, prognostic). Therefore we suggest that patients with COPD in the normal to overweight range have better prognosis.

Limitations of the Study: Our study was constrained by the small size of the sample available. The morbidly obese were not included in our study.

Conflict of Interest: The authors do not have any conflicts of interest to declare.

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Effect of Exercise Program in Reducing Risk of Fall in Elderly People

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Abstract

Objective: To study the Effect of Exercise Program in reducing risk of fall in elderly subject.

Materials and Method: Total 30 elderly subjects(10 males and 20 females) aged above 60 years were having problem with flexibility, balance and high risk of fall were selected for the assessment of their flexibility, gait and balance. Subjects who are bed ridden, having neurological conditions, Psychiatry condition and visual deficit were excluded from the study. Outcome measures used were Morse fall risk assessment tool, Timed up and go test, Functional reach test, Functional gait assessment.

Conclusion: The present study provided evidence to conclude that the exercise programme was significantly effective in improving strength, flexibility and balance along with reducing risk of fall in elderly population.

Keywords: *Fall, Elderly subject, flexibility, balance, gait, strength, exercise.*

Introduction

Fall is defined as unintentionally coming to rest on the ground or other level with or without consciousness. Falls are faced by elderly population. Balance in elderly is affected by both diseases as well as age related issues along with problems like cognitive impairment, various medications and environmental changes all appear to contribute to the increase risk of falls.[1]

Falls among elderly is a major public issue interfering with social essential. It has various physical, medical, psychological, social and economic consequences. This include disability and deformity,fear of repeated falls,direct costs of medical care associated with injuries and loss of potential income. The environment is perceived to play an significant role in falls experienced by the elderly population.[1]

Walking difficulty is very common problem experienced in older adults which leads to loss of independence. Multiple changes in different systems of body contribute to change in walking pattern in elderly. The disability of gait is a gradual process. This group of age related deficits results in inefficient gait. Body mechanics are altered starting with flexed trunk posture, decreased hip extension in mild to late stance, decreased ankle plantar flexion at power push off and movement control is disturbed like reduced rate of forward momentum, stride length and time variability, and timing issues, and difficulty in transitioning from stance to swing. Reduced hip extension causes blocking of the mechanical accumulation of potential energy in the limb tissue during stance phase with release during swing to fuel the limb forward movement, while also eliminating the hip extension. The loss of motor skills, high energy cost of walking is major factor contributing in the age-related decline in physical function and activity for older adults.[2]

The risk factor contributing to falls can be classified into two categories.

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Intrinsic and Extrinsic factors. Intrinsic factors typically includes Age, Gender, Poor balance, Weakness, Mobility whereas on the other hand extrinsic factors include Poor lighting, Slippery surface, Obstacles etc.[3]

Gait is one of the basic component to determine independency of function. Many physical therapy interventions are therefore, directed to restore and improve subject ambulation status.[4]

Various studies have been shown the effects of various physical exercise programs on the functional capacity of older subject. Resistance training, endurance training, balance training and combination of this exercise have beneficial effects on certain functional parameters in frail elderly subject.[5]

Studies on resistance training have shown that this type of exercise program can improve neuromuscular activity, muscle mass, strength, power and functional capacity as well as improve cardiovascular function. [5]

Balance training is another type of exercise intervention which can help to prevent fall. [5]

Exercise intervention include gait training, resistance exercise and balance training where resistance training has positive effects on the strength and bone density.[6,7]

Resistance exercises can be used for strengthening weak lower limb musculature as they function as prime movers of the limbs, also act as synergists to stabilize the trunk, and sometimes act as antagonists, which help to decelerate limb. Exercises to improve muscle strength and power helps in enhancing the ability of a weak lower limb musculature, like the plantar flexors of ankle. This helps in aiding the ground reaction forces. [2]

Stretching exercises aiding joint range of motion(ROM) helps in maintaining the postures of the limbs or trunk. Secondly the desired length of muscles can be obtained for optimal activation during dorsiflexion and in heel strike a appropriate lengthening of the calf muscles is needed to facilitate activation and lastly for appropriate movement-related feedback to the nervous system.[2]

A multi-component exercise intervention program that consists of strength, endurance, and balance training appears to be the best strategy for improving gait, balance, and strength, as well as reducing the rate of falls in elderly individuals and consequently maintaining their functional capacity during aging.[5]

Fall in older age population are related to socio economic, environment, behavioral and biological factors. Socioeconomic factors like low income & education levels, inadequate housing and lack of social. Environment al factors like poor building design, slippery floors. Biological factors like age, chronic illness. Behavioral factors like excess alcohol intake, lack of exercise and inappropriate foot.[8]

Materials and Methodology

Study Type: Experimental

Study Design: Pre and post

Sampling Method: Simple random sampling

Sample Size: 30

Study Duration: 6 months

Place of Study: Karad

Participants: Total 30 elderly subjects (10 males and 20 females) aged above 60 years were having problem with flexibility, balance and high risk of fall were selected for the assessment of their flexibility, gait and balance. Subjects who are bed ridden, having neurological conditions, psychiatry condition and visual deficit were excluded from the study. Outcome measures used were Morse fall risk assessment tool, Timed up and go test, Functional reach test, Functional gait assessment. Each and every elderly person was approached and informed consent was taken from the individuals, willing to participate. They were explained about the procedure of the study and then were assessed for flexibility, gait and balance using the outcome measure, after the demographic data from the individuals was collected.

Outcome Measures: Outcome measures used were Morse fall risk assessment tool, Timed up and go test, Functional reach test, Functional gait assessment. After the selection of appropriate candidates fulfilling the criteria they were asked to fill the questionnaire to record the number of falls prior starting the treatment. Subjects were asked to perform the set of exercises according to the set protocol. The set of exercises were practiced for 1 month and follow up was done for 5 months. The results gained after completing the 6 month protocol were noted by Morse fall risk assessment tool, time up go test, functional reach test. The change in individual's number of falls was noted by the pre and post answers noted in the questionnaire.

Statistical Analysis: Within group comparison statistical analysis of all pre and post interventional values was done by paried 't' test. The statistical analysis for MORSE FALL ASSESSMENT TOOL showed significant improvement within the group(p=<0.0001). The statistical analysis for FUCNTIONAL GAIT ASSESSMENT showed significant improvement within the group(p=<0.0001). The statistical analysis for TIMED UP GO TEST showed significant improvement within the group(p=<0.0001). The statistical analysis for FUNCTIONAL REACH TEST showed significant improvement within the group (p=<0.0001).

Table 1: Baseline Parameters

Parameters	Pre	Post	t value	p value	Inference
Timed up go test	3.773 ± 2.087	5.333 ± 2.705	9.252	< 0.0001	Significant
Functional reach test	5.427 ± 0.8542	5.830 ± 0.9692	8.003	< 0.0001	Significant
Functional gait assessment	22.567± 4.006	20.5± 3.138	4.821	< 0.0001	Significant
Morse fall risk assessment tool	48.5±21.502	39.667±19.517	7.737	< 0.0001	Significant

Discussion

This study "effect of exercise program in reducing risk of fall in elderly subject" was conducted among elderly population in Karad. As risk of fall increases among elderly subject due various factors, prevalence of falls is 30% in elderly population. Previously the studies have been conducted on the fall prevention. Until now, there was no study done to find the effect of exercise in reducing risk of fall in elderly subject.

Aim was to study the Effect of Exercise Program in reducing risk of fall in elderly subject. Objectives were to determine the effect of exercise program in reducing risk of fall. Inclusion criteria were age group of 60 years and above, both Male and female with history of fall. Exclusion criteria were bed ridden patient, existing Neurological condition, Patient with Psychiatry condition and Subject with visual deficit.

Total 30 elderly subjects (10 males and 20 females) aged above 60 years were having problem with flexibility, balance and high risk of fall were selected for the assessment of their flexibility, gait and balance. Subjects who are bed ridden, having neurological conditions, Psychiatry condition and visual deficit were excluded from the study. Outcome measures used were Morse fall risk assessment tool, Timed up and go test, Functional reach test, Functional gait assessment.

They were explained about the study and treatment protocol. Written consent was taken from the subjects. They were given the questionnaire to fill and tests were taken to find out the risk of fall. After the selection of appropriate candidates fulfilling the criteria they were asked to fill the questionnaire to record the number of falls prior starting the treatment. Subjects were asked to perform the set of exercises according the set protocol. This set of exercises were practiced for 1 month and follow up was done for 5 months . The results gained after completing the 6 month protocol were noted by Morse fall risk assessment tool, time up go test, functional reach test. The change in individual's number of falls was noted by the pre and post answers noted in the questionnaire.

Conclusion

In this study the exercise programme was significantly effective in improving strength, flexibility and balance along with reducing risk of fall in elderly population.

Hence Alternative hypothesis is proved.

Conflict of Interest: The authors declare that there are no conflicts of interest concerning the content of the present study.

Source of Funding: This study was self funded.

Ethical Clearance: The study was approved by the institutional ethical committee of KIMSDU.

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Regenerative Endodontics-The Future? A Questionnaire Based Study

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Abstract

Introduction: Regenerative Endodontics is a fast growing field in dentistry showing highly favourable clinical outcomes. It encompasses various procedures that serve as a better alternative to traditional root canal therapy as well as more aggressive treatments such as surgical endodontics. The knowledge and skill of the practitioner plays a pivotal role in the success of any regenerative procedure.

Aim: The purpose of this survey is to evaluate knowledge, attitudes and practice of regenerative endodontics among the dental Interns, dental postgraduates and dental practitioners in mangaluru.

Materials and Method: An online questionnaire comprising of 20 questions was distributed amongst the dental professionals of Manguluru. A total of 448 dental professionals responded over a period of 1 month. Their responses were collected and tabulated to interpret the data and obtain the results.

Results: A total of 448 replies were received, with the majority of the correspondents belonging to the dental post graduates (41.5%). The majority (97%) of the participants of this survey had come across the term 'Regenerative Endodontics', but only 41 out of the 448 had reported performing any regenerative endodontic procedure.

Conclusion: Regenerative endodontic Procedures have shown favourable results in various studies. It can be used as a valuable tool for any dental professional. But, as seen in this study, the knowledge levels as well as attitudes amongst the dental fraternity needs to improve so as to allow the incorporation of regenerative endodontics into clinical practice.

Keywords: *Regenerative, Survey, Knowledge.*

Introduction

Regenerative endodontic procedures(REP's) were proposed to overcome the drawbacks related to the clinical management of necrotic immature permanent teeth and are gaining prominence over traditional apexification procedures amongst researchers and clinicians.[1]

Regenerative endodontic procedures can be defined as biologically based procedures designed to replace damaged structures, including dentin and root structures, as well as cells of the pulp-dentin complex.[2]

In other words, regenerative endodontics is a broad term encompassing various procedures such as pulp revascularisation, apexogenesis, pulp implantation, three-dimensional cell printing etc.[2]

The success of regenerative endodontics, like any other dental procedure, depends upon the knowledge and skill of the practitioner. Although, regenerative

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procedures are highly technique sensitive and require a systematic protocol to be followed.

Hence, the knowledge of the practitioner regarding these procedures is of paramount importance. Since very few studies have been conducted in this regard and little information about this is available, the aim of this survey is to evaluate knowledge, attitudes and practice of regenerative endodontics among the dental Interns, dental postgraduates and dental practitioners in mangaluru.

Materials and Method

The study undertaken was a questionnaire-based survey to evaluate the awareness and attitudes towards regenerative endodontics, with a questionnaire comprising of 20 questions. Out of this, 15 questions were framed to evaluate the knowledge and awareness of dental professionals towards REP's, while 5 were framed to reveal their attitudes towards the same.

The questions were arranged systematically to evaluate the awareness, knowledge and attitudes of the dental practitioners in the region of Mangaluru, towards regenerative endodontic procedures.

Using 'Google Docs', an online questionnaire was created to be distributed amongst the dental professionals of mangaluru digitally. This was done by distributing the link to the questionnaire. https://docs.google.com/forms/d/e/1FAIpQLScxYl8XLC4yK2PsDovd4hQHqSQMcYtTULLYucTErJCZ_buKiQ/viewform#start=openform

Printed copies of the questionnaire were also used and were circulated individually amongst the practitioners. Only dental interns, dental post graduates and dental practitioners were provided with the questionnaire. Responses to both the online form as well as the hard copy of the questionnaire were accepted for a period of 1 month.

All the data was then collected and tabulated. This was later analysed to obtain the results of the survey.

Results

A total of 448 replies were received for the survey, both online and offline. Out of this, most of the correspondents were the dental postgraduates (41.5%), followed by the dental practitioners (31.9%) and then the dental interns (26.6%).

The age of the participants ranged from 21 to 52 years, with an average age of 27 years. Amongst the dental practitioners, the average number of years of practice was 7.5 years.

Table 1: Questions drafted so as to determine the knowledge levels of the various participants in the field of regenerative endodontics

Question	Response		
	Yes	No	Not Sure
Do you think Regenerative procedures can serve as a practical and feasible replacement for more aggressive treatment protocols?	292(65.2%)	66(14.7%)	90(20.1%)
Do you think regenerative procedures can serve as an alternative to implants?	128(28.6%)	186(41.5%)	134(29.9%)
Single visit procedure is recommended for regenerative endodontic treatment.	26(5.8%)	338(75.4%)	84(18.8%)
Leaching of Sodium Hypochlorite (NaOCl) into the periapical space has a detrimental effect on revascularisation procedures.	289(64.5%)	42(9.4%)	117(26.1%)
The use of Ethylene-Diamine-Tetra-acetic acid (EDTA) is recommended along with Sodium Hypochlorite (NaOCl) during revitalisation procedures.	161(35.9%)	108(24.1%)	179(40%)
Revascularisation procedures performed on teeth with a large apical foramen diameter are more successful than teeth with a small apical foramen.	172(38.4%)	102(22.8%)	174(38.8%)
Should revascularisation be performed on deciduous teeth?	30(6.7%)	288(64.3%)	130(29%)

Table 2: The technical aspects of regenerative procedures was inquired with these following questions.

QUESTION	RESPONSE			
	Root Resorption	Immature Apex with Necrotic Pulp	Persistent Peri-apical Infection	Peri-radicular Cyst Resolution
Which of the following indications is best suited for treatment by a regenerative endodontic procedure?	62(13.8%)	350(78.1%)	26(5.8%)	10(2.2%)
According to you, which of the following outcomes from regenerative treatments is the most valuable?	Healing of Peri-radicular Bone	Pulp Tissue Revitalisation	Continued Root Development of Immature Teeth	All of The Above
	20(4.5%)	32(7.1%)	83(18.5%)	313(69.9%)
During revascularisation procedures, stem cells are introduced into the canal by?	Placing A Scaffold	Placing A Bioceramic Material	Inducing Bleeding From The Peri-apical Region	Stem Cells Are Not Required
	88(19.6%)	68(15.2%)	265(59.2%)	27(6%)
Which of the following, do you think, best serves as a scaffold during Pulp Revitalisation Therapy?	Collagen	Platelet Rich Plasma	Platelet Rich Fibrin	Bioceramics
	45(10%)	160(35.7%)	179(40%)	64(14.3%)

Table 3: The scope and future aspects of REP's, according to the participants, was Questioned.

QUESTION	RESPONSE			
	Higher Cost Factor	Complicated Procedure	Fear of Performing Such Treatments	Lack of Patient Confidence In Regenerative Procedures
What, according to you, would be the biggest obstacle to regenerative endodontic procedures?	227(50.7%)	115(25.7%)	26(5.8%)	80(17.9%)
When do you think regenerative procedures will be frequently practiced in dental clinics?	Already Being Practiced	1 to 5 Years From Now	6 to 10 Years From Now	More Than 10 Years From Now
	34(7.6%)	50(11.2%)	77(17.2%)	287(64.1%)
How many years, do you think, it will take for dentists to implant teeth grown in a laboratory?	1 to 10 Years From Now	11 to 20 Years From Now	More Than 20 Years From Now	Never
	34(7.6%)	55(12.3%)	332(74.1%)	27(6%)

Discussion

In this survey, 97% (435) of the correspondents had come across the term 'Regenerative Endodontics'. This showed a high awareness amongst the population of dentists in mangaluru. In a similar study conducted amongst dental residents in selected hospitals within Nigeria, 91.2% (114) of the participants had come across the term regenerative endodontics.[3]

Pulp revascularisation and apexogenesis were the 2 procedures(88.2%&78.3%respectively)mostrecognised in this study to fall under the term of Regenerative Endodontics. Few of the correspondents also believed direct pulp capping (20.2%) and apexification (9.6%) to be regenerative procedures, but, even though they fulfil the criteria stipulated for regenerative procedures of growth of tooth structures, they are not considered under the umbrella of regenerative endodontics.

A total of 41(9.1%) respondents reported practicing regenerative procedures, with apexogenesis (18) and pulp revascularisation (14) the most practiced procedures.

A total of 292(65%) of the respondents believed that REP's can replace more aggressive treatment

modalities. This is supported by available literature, displaying a high success rate for procedures such as pulp revascularisation and apexogenesis. A cohort study investigated 20 cases of regenerative endodontic therapy for immature permanent teeth with necrotic pulps and showed that the success or survival rate of treated teeth was 100% in terms of regression of clinical symptoms/ signs and resolution of apical periodontitis or retention of teeth. [4]

But, it is also important to view the failures for REP's. A study conducted by song et.al (2017) showed the presence of Revascularisation Associated Intra-Canal Calcifications in 62% of the cases under the study.[5]

When it came to REP's serving as an alternative to implants, the majority of the correspondents (71%) were sceptical towards it's ability for the same. The current philosophy in tissue engineering is developing/ regenerating a whole new organ. This can be achieved either by seeding tooth germ cells in a tooth shaped scaffold or recreating the tooth germ from detached mesenchymal and epithelial cells.[6] But, this technology is still in its infancy. This may also explain why 332 of the total correspondents believed that it would take atleast 20 years for a tooth developed in a lab to be implanted in the oral cavity.

A multiple visit protocol using a tri-antibiotic paste may be a better treatment option for teeth with complete pulpal necrosis, during revascularisation procedures.[7] 338(75.4%) of the respondents also believed the same, as they did not believe single visit endodontics is recommended for regenerative procedures. Shin et al. had proposed a single visit procedure using an intra canal medicament,but it showed limited success.[7]

Disinfection of the root canal space is paramount towards the success of any Regenerative procedure. Both irrigants as well as intra canal medicaments can be used.[8] The most recognised irrigant in the survey was sodium hypochlorite and the most recognised intra canal medicament was the triple antibiotic paste (TAP). Although TAP has been shown to be more effective in eradicating bacteria,[9] it has the potential for tooth disco-loration, which results from contact between minocycline and the root canal walls during the REP.[10] Exclusion of minocycline (known as double antibiotic paste) or substitution of minocycline by amoxicillin, doxycycline, clindamycin, tetracycline or cefaclor has been reported to solve this problem.[11]

Sodium hypochlorite has a detrimental effect on the stem cells. [12,16] The majority of the correspondents were aware of this fact, with 289(64.5%) believing that leaching of sodium hypochlorite into the periapical space is harmful for the regenerative procedure. Out of those who did not agree to the same, the majority of the correspondents belonged to the group of dental interns.

In a study conducted by martin et al. (2014), the use of 17% EDTA resulted in increased survival and DSPP expression, partially reversing the deleterious effects of NaOCl. [12] This study showed that the highest awareness regarding this information existed amongst the post graduates. As the speciality of the participants were not recorded, the awareness amongst the various specialities could not be determined.

Teeth with pre-operative apical diameters wider than 1 mm have been reported to show a greater increase in root thickness, length, and apical narrowing. This finding suggests that revascularization of necrotic pulps with fully formed (closed) apices might require instrumentation of the tooth apex to approximately 1 to 2mm in apical diameter to allow systemic bleeding into root canal systems. [13]There was reduced knowledge regarding this fact, as only 154(35%) correspondents were aware of it. Again, the post graduates showed the highest awareness regarding the same.

The most recognised scaffold, in this survey, to be used during REP's was Platelet Rich Fibrin. A study comparing platelet rich plasma (PRP), platelet rich fibrin (PRF) and blood clot, showed that PRF had a huge potential to accelerate the growth characteristics in immature necrotic permanent teeth as compared to PRP and blood clot. [14]

227(50.7%) of the correspondents believed that the higher cost factor for regenerative procedures would be its biggest obstacle.In a similar survey conducted by Utneja et al (2012), 74% of the participants believed that the higher cost factor would be the biggest obstacle to regenerative procedures. [15]

For those believing that complicated procedures are the biggest obstacle for regenerative endodontics, the majority belonged to the practicing dentists (40%), which may indicate a lack of trust in such procedures by practitioners.

Conclusion

Traditional root canal therapy of necrotic pulps is mechanically and materially based. But, Regenerative endodontic therapy is biologically based and intended to promote the host's natural wound healing process to restore vitality, immunity, and sensitivity of tissue in the canal space, that was destroyed by infection or trauma.

In order to harness this potential, the dental practitioners need to be aware and well informed regarding the same. This will allow the introduction of a new era in clinical endodontic dentistry, that will help in preserving the vitality of the tooth.

In this study, the dental interns lacked knowledge regarding certain aspects of the regenerative endodontic procedures. Training regarding the same can be done so as to facilitate the incorporation of regenerative endodontics in dental clinics.

A wider study group, incorporating a larger region could be done in the future to analyse the trend of REP's in today's environment.

Limitations: The study did not differentiate between the various specialities of the post graduates as well as the practitioners. Hence, knowledge levels regarding REP's between each speciality could not be determined. The study also did not differentiate between general practitioners and dental specialists.

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Conflict of Interest: None

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Breast Cancer Screening: Are 'At Risk Population' Known by Public Health Nurse Practitioners?

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Abstract

Introduction: Health care providers, especially Public Health Nurse who come in regular contact with women, can play an important role in providing the information regarding breast cancer. Hence this study is undertaken to assess the knowledge of risk factors associated with breast cancer and screening for breast cancer among Public Health nurse practitioners.

Method: This is a cross-sectional study designed to assess the Knowledge of risk factors associated with breast cancer and screening for breast cancer among Public Health nurse practitioners working in the Health centres of Dept of Community Medicine of Hassan Institute of Medical Sciences. All (30) Public Health nurse practitioners in the Seven Primary care facilities participated in the study.

Results: Fourteen percent of Public Health Nurse knew that most common cancer among women was breast cancer. However, 43% were aware that the obesity increased the risk of developing breast cancer. Whereas 60% were aware that nulliparity was a risk factor for developing breast cancer and 43% said having 2 or more children decreased the risk of developing breast cancer. However, 33% knew breast feeding was protective against breast cancer. Moreover, early menstruation and late menarche were known to be risk factors by 20% each, and 33% knew physical activity could be a preventive factor for Breast cancer. 96% were aware that a lump in the breast was a sign of breast cancer and 56% said discharge from the nipple was also a sign of cancer in the breast. All 100% knew that Breast Self-Examination was a screening method and only 20% were aware that clinical examination was also a method for identification of breast cancer.

Conclusion: District Health Authorities should periodically train public health nurses to improve their knowledge regarding risk factors, early signs and symptoms of breast cancer and method of cancer screening. This intern would help them to educate, suspect, and detect the breast cancer among the risk population at the earliest.

Keywords: *Breast Cancer, Risk factors, Public Health Nurse.*

Introduction

Breast cancer is the most common female cancer in the world with an estimated 2.08 million (24.2%) new cancer cases diagnosed in 2018. With age standardised incidence rate of 46.3/100000 women and age standardised mortality rate of 13/100000 women. While in India also it has now become the most common female cancer with 162 468 (27.7%) new cases reported in 2018. Whereas the age standardised incidence rate was 24/100000 women, 87090 women died from breast cancer in 2018 giving an age adjusted mortality rate of 13 per 100000 of population. And is estimated to increase to 261850 by 2040.[1]

Breast cancer risk factors include increased age, early menstrual period, late or no pregnancy, starting

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menopause after age 55, not being physically active, being overweight or obese after menopause, having dense breast, using combination hormone therapy, taking oral contraceptives, personal history of breast cancer, family history of breast cancer, previous treatment using radiation therapy and alcohol consumption. [2-8]

Adequate knowledge about the signs and symptoms and early breast cancer detection through breast self-examination (BSE) or clinical breast examination (CBE) or mammogram, is crucial to reducing breast cancer-related morbidity and mortality.[9] Screening asymptomatic women by means of breast self-examination, clinical examination or mammography can play a significant role in decreasing breast-cancer mortality in developing countries.[10] The Breast Health Global Initiative developed appropriate guidelines that can be used in nations with limited health care resources to improve breast cancer outcomes.[11]

Health care providers, especially Public Health Nurse who come in regular contact with women, can play an important role in providing the information regarding breast cancer.[12] Empowering nurses with information about early detection method and their related benefits could help in advancing their skills in performing breast self-examination and expanding their role as client educators.[13] Education and awareness need to be culturally appropriate and targeted towards the relevant risk population, because this may contribute towards an increase in early presentation so that highest benefit can be gained.[14] The information obtained could help to initiate interventions to address the gaps in knowledge of Public Health Nurses towards breast cancer-related risk factors, signs and symptoms and early breast cancer detection through breast self-examination (BSE) or clinical breast examination (CBE). Hence this study is undertaken to assess the knowledge of risk factors associated with breast cancer and screening for breast cancer among Public Health nurse practitioners.

Methodology

This is a cross-sectional study designed to assess the knowledge of, risk factors associated with breast cancer and screening for breast cancer among Public Health nurse practitioner in the Health centres of Dept of Community Medicine of Hassan Institute of Medical Sciences. We have seven Health Centre with following number of Public Health Nurse Practitioners (Salagame PHC (7), Krishna Urban PHC (5), Shantigrama CHC (5), Masalehosahalli CHC (3), Nitturu PHC (4), Dudda CHC (3), Konanuru PHC (3)). All (30) Public Health nurse practitioners in the selected health facilities participate in the study over a period of 2 months. A pretested questionnaire was used to collect the data. The questionnaire included information on sociodemographic profile of the study subjects, knowledge of breast cancer risk factors, knowledge of breast cancer signs and symptoms, knowledge of Breast Self-Examination, Clinical Examination and Mammography. Data collection on Knowledge of breast cancer among the participants was assessed based on knowledge on risk factors of breast cancer, signs and symptoms of breast cancer and knowledge on BSE and CBE. The assessment is done by scoring breast cancer knowledge computed by giving "1" to the correct answer, and "0" for the wrong and 'do not know' answers. The data obtained was entered excel and analysed using epi info software. The data is display using tables and graphs.

Results

Knowledge about the risk factors for breast cancer among the study participants: Thirteen percent of Public health nurse knew that most common cancer among women was breast cancer and 36% said this cancer was inherited. However, 43% were aware that the obesity increased the risk of developing breast cancer and 30% were aware that the large breast increases the risk of developing breast cancer. Whereas 60% were aware that nulliparity was a risk factor for developing breast cancer and 43% said having 2 or more children decreased the risk of developing breast cancer. However, 33% knew breast feeding was protective against breast cancer. Moreover, early menstruation and late menarche were known to be risk factors by 20% each. However, 60% knew that advancing age was a risk factor for Breast cancer and 66% knew consumption of alcohol can be a risk factor for developing breast cancer but only 33% knew that physical activity could be a preventive factor for Breast cancer. (Table -1)

Knowledge about signs and symptoms of Breast Cancer: 96% were aware that a lump in the breast was a sign of breast cancer and 56% said discharge from the nipple was also a sign of cancer in the breast, whereas 80% of the Public health nurse said pain and swelling in the breast was also a sign of Breast Cancer. Dimpling in the breast was understood to be a sign cancer among 50% of Public health nurse and 46% were aware that ulceration in the breast can be a sign of cancer. Only

30% knew that weight loss can also be a symptom of cancer whereas a majority 63% were aware that the change in the shape of the breast tissue can be a sign of cancer. A minimal 16% of Public health nurse had known that inversion of nipple can be a sign of cancer but 46% were aware that a lump in the arm pit could be a sign of breast cancer. But very few 16% knew that the dry skin on the nipple region can be a symptom of breast cancer. (Table 2).

Knowledge about Screening Method: A large majority 100% knew that Breast Self-Examination was a screening method to appreciate sign of cancer and only 20% were aware that clinical examination was also a method for identification of breast cancer and none of them knew about mammography as a screening method for identification of breast cancer. (Table 3).

Table 1: Knowledge about risk factors of breast cancer among the study Participants

		No (30)	%	Sd
1	Breast cancer is the most common cancers among women	4	13	1.4
2	Breast Cancer is an Inherited Disease	11	36	3.5
3	Being Overweight and Obese increase the risk of developing Breast Cancer	13	43	4.4
4	Breast cancer is more common among Nulliparity increased the risk of developing Breast cancer	18	60	5.9
5	Large Breast increased the risk of Breast Cancer	9	30	2.9
6	Breastfeeding may decrease the risk of breast cancer development	10	33	3.5
7	Bearing two or more children decreases the risk of breast cancer	13	43	4.3
8	Early Menarche may increase the risk of breast cancer	6	20	2.1
9	Late menopause may increase the risk of breast cancer	6	20	2.1
10	Breast cancer risk increase with advancing age	18	60	5.9
11	Smoking and Alcohol consumption increase the risk of breast cancer	20	66	6.8
12	Does physical activity decrease the risk of developing breast cancer?	10	33	3.9

Table 2: Knowledge about Signs and Symptoms of Breast Cancer

		No (30)	%	Sd
1	Lump in the breast	29	96	9.3
2	Discharge from the breast	17	56	5.5
3	Pain and Soreness in the breast	24	80	8
4	Dimpling in the breast	15	50	5.4
5	Ulceration in the breast	14	46	4.6
6	Weight loss	9	30	3.2
7	Change in the shape of the breast	19	63	6.7
8	Inversion in nipple	5	16	2.4
9	Lump Under Armpit	14	46	4.7
10	Dry Skin on Nipple region	5	16	1.8

Table 3: Knowledge about Screening Method

		No (30)	%	Sd
1	Brest Self Examination	30	100	9.6
2	Clinical Breast Examination	6	20	2.6
3	Mammography	0	0	0

Discussion

Breast cancer is the most common female cancer in the world as well as in India. Panieri E et al 2012.[15] Opined that screening asymptomatic women by means of breast self-examination, clinical examination or mammography can play a significant role in early detection of breast cancer.[13].

Knowledge about the risk factors for breast cancer among the study participants: Only thirteen percent of Public health nurses knew that most common cancer among women was breast cancer. The study shows that our public health nurses are not oriented to the problem of Cancer in their population and women cancer in particular. However, factors like multiparity, breast feeding and physical activity as protective factors was not known by many. This shows that the respondents are not informed of the protective factors. Shuyuasa et al[16] in their study found that the risk for breast cancer development among single was 49% more as compared to the married women and also nulliparous woman had 38% more risk as compared to women with 5 or more children. A recent meta-analysis by Zhou Y et al[17] in 2015 involving twenty-four articles with 13,907 breast cancer cases showed that breastfeeding was inversely associated with the risk of breast cancer. Wherein the relative risk of breast cancer for the ever breastfeeding compared with never was 0.613 and an inverse association was found for the longest as compared with the shortest duration of breastfeeding with the relative risk of 0.471. Also, Pettapiece-Phillips R et al (2015)[18] in their study reported that physical activity increases the expression of normal *BRCA1* or *BRCA2* gene and their by mitigating inherited *BRCA* mutation. Our study shows that the study population are poorly informed about the association of mensuration on breast cancer. This has been documented by shuyuasa et al[16], that relative risks of breast cancer for women reporting menarche prior to the age of 13 years was twice as high as that for those with menarche occurring after 16 years of age. The author also recorded relative risk of 1.40 for women reporting menopause at 50 years of age or over, as compared to those reporting it prior to 50 years. Also 66% knew consumption of alcohol can be a risk factor for developing breast cancer. This association was recorded by Romieu et al 2015 [19] in their study, wherein it was estimated that, for each 10 g/day increase in alcohol intake the risk increased by 4.2%.

Knowledge about signs and symptoms of Breast Cancer: 96% were aware that a lump in the breast was a sign of breast cancer, which is better than that of a finding reported by Negalign Getahun et al [20] from china where breast lump was the most commonly known symptom of cancer by 61.7% of the respondents. This may be because of the recent experience of the public health nurses with the cases in their field practice areas. Dimpling in the breast was understood to be a sign of cancer among 50% of public health nurse and 46% were aware that ulceration in the breast can be a sign of cancer. Similar observations were reported by Andegiorgish et al [21] in their study, where more than 85% of the respondents stated that a lump in the breast, change in the size of the breast and discoloration/dimpling of the breasts are the major signs of breast cancer.

Knowledge about Screening Method: All 100% knew that Breast Self-Examination was a screening method to appreciate sign of cancer and only few were aware that clinical examination was also a method for identification of breast cancer, Santhana krishnan et al[22] in their study among nursing staff reported that 73.2% mentioned BSE as a screening test and only 20% mentioned CBE as a diagnostic test. This observation is likely because of the training under non communicable disease programme initiative where predominantly teaching is about the signs and symptoms of breast cancer and about breast self-examination.

Conclusion

Our study revealed minimal awareness of risk factors associated with breast cancer among respondents. The study found that majority of the respondents answered the most common symptom of breast cancer and were aware of breast-self-examination. So, we recommend that District Health Authorities to periodically train public health nurses to improve their knowledge regarding risk factors, early signs and symptoms of breast cancer and method of cancer screening. This intern would help them to educate, examine and detect the breast cancer among the risk population at the earliest.

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Credibility of Health Care Advertising-An Empirical Understanding of its Multi-Dimensional Structure and Scale Validation with Special Reference to Children's Health Food Drinks

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Abstract

Advertising techniques need to be transformed based on the observations of the perceptions of consumers since they can be the directional force to any advertising aimed at those groups. The study fruitfully provides an empirical understanding about the multiple components of advertising credibility of consumer healthcare products. One of the major tasks undertaken in this research was to develop a scale which is statistically reliable and valid to measure advertising credibility in the current marketing environment of Kerala with special reference to children's health drinks.

Keywords: *Advertising credibility, corporate credibility, endorser credibility, message content credibility, consumer health care, health food drinks.*

Introduction

The tough competition in the market and large volume of advertisements make the consumers confused regarding purchase decision making. There is a tendency in the minds of consumers to distrust advertising and to doubt about the genuineness of producers and products. Sometimes they feel exploited by the advertisers. This often results in the failure of advertisements and loss of money. The opportunity for consumers to raise voice and file complaints against non-credible/ misleading advertisements again increases the risk of facing legal actions. According to Rodgers and Moore[1], advertisements that lack credibility, are often ignored or avoided by consumers. Hence knowledge about the perceived credibility of advertisements and consumer psychology may help the advertisers and marketers to avoid mistakes and adopt the right advertisement tactics. In fact, from a careful review of past-related works the researcher could observe that still gaps existed in areas of existing knowledge related to advertising credibility in terms of variables, dimensions, scales,sample, context etc. The previous studies conducted in this area approached advertising credibility with limited dimensions and items. Therefore, this paper attempts to develop a valid scale to measure Advertising Credibility. Children's Health Food Drinks segment is opted to study the dimensions and structure of perceived advertising credibility.

Credibility of Advertising: Credibility has been identified as one of the most important characteristics of a persuasive message which frequently affect the result of persuasive messages[1,2]. Advertising credibility can be defined as "the extent to which the consumer perceives claims made about the brand in the ad, to be truthful and believable"[3,4]. Rodgers and Moore[1] argue that the advertisements those lack credibility are generally ignored or avoided by consumers. According to Lafferty and Goldsmith[5], irrespective of media type, advertising credibility is a crucial inspiration for creation of attitude and subsequent behaviors.

Dimensions of Advertising Credibility: Perceived credibility of an advertisement is influenced by numerous factors, especially by the firm's credibility,

the credibility of the person who brings a message[6] and the credibility of the information content[7]. As per the literature advertising credibility has three components:

Advertiser/Corporate Credibility: Corporate credibility is defined as "the extent to which consumers believe that a firm can design and deliver products and services that satisfy customer needs and wants"[8], and has been found to have direct, positive impacts on attitude toward the ad, attitude toward the brand, and purchase intention[2,6,9].

Endorser Credibility: An endorser is an individual,recognized by the public and uses this recognition on behalf of a consumer good, by appearing with it in an advertisement[10]. Endorser credibility in this research indicates a term used to specify a communicator's positive characteristics and trustworthiness that affect the receiver's acceptance of a message[6,11]. Endorser credibility is further be classified intothree: -'Expertise','Trustworthiness' and 'Attractiveness'[6, 9,11].

Message Content Credibility: Quality of message or argument is another important determinant of ad credibility. In a study Austin and Dong[12] tried to determine if the sender along with the message would have anyimpact on the total credibility of the information. They concluded that the perceived credibility of the information is more influenced by the message than by the sender.

Objectives of the Study:

1. To understand the structure of perceived advertising credibility
2. To develop and validate a multi-dimensional scale for measuring perceived advertising credibility

Research Methodology

Exploratory and descriptive research design and survey approach have been used for the study. A preliminary study was conducted to understand the dimension structure of advertising credibility which comprised a focus group interview and pilot study. The sample for the focus group interview consisted of 50 mothers of children between 5-15 years old, and who are the consumers of CHFD and who watch TV commercials and 6 experts from advertising industry and 4 experts from marketing research. The in-depth interviews with 50 respondents were conducted and the as the second stage a pilot study was conducted by collecting responses from 50 respondents from Kochi, a South Indian City, and ensured the reliability of the instruments used for data collection.

The children's health food drinks (CHFD) industry is selected for studying the credibility of advertising communication. The CHFD brands selected for the study are Horlicks, Bournivita, Complan and Boost. The sample for the study was taken from the six corporations of Kerala state namely Kozhikode, Trichur, Kochi, Kollam, Kannur and Thiruvananthapuram. The mothers of children between 5-15 years were surveyed. For the selection of the wards (divisions) under study and for the selection of the sample respondents from the wards, multistage random sampling is used. The 2011 census document and 2015 voters list of the corporation were taken as sampling frame. The research instruments included structured questionnaires, advertisement story board and recorded TV commercials. The mothers were informed to respond to the questions related to the advertisements of their most preferred children's health drink brand. A total of 1252 responses were used for data analysis.

Measurement Tool Development: The results of focus interview and literature review gave insights in to the dimensions that should be highlighted in the study. After identifying the three relevant dimensions of ad credibility (corporate credibility, endorser credibility and message-content credibility) through focus interview, the items from validated scales used in the previous research were taken to construct the scale for advertising credibility. To measure corporate credibility 7 item scale is used based on the scale developed and validated by Newell and Goldsmith[13]. The endorser credibility measurement (13 items) was based on the scales of Ohanion, R.[11] and Goldsmith, et al.[6]. The message/ content credibility scale is developed based on the measures of Kemp, Deena G.[14], McKenzie and Lutz[4] and Wang[15] and focus group study.

Data Analysis and Discussion: The verification and cleaning of the collected data was done initially. Verification of Missing Values was done using frequency test, Outliers using Z-scores, Normality and Randomness using Kolomogorov-Smirnov test with Lillefors significance correction. Skewness and kurtosis are used to ensure non-normality doesn't exist to a problematic level. Durbin- Watson statistics was found 2.046 thus established independent observations and

"Runs" test was used to confirm randomness. Content validity is ensured through extensive literature review which helped also in the development of the constructs [16]. In this research a pilot study is conducted to ensure that the content validity concept is not violated. Criterion-related validity is ensured by using a common scale (five-point Likert scale) for measurement throughout the questionnaire.

Exploratory Factor Analysis: The next step in the scale validation procedure is to discover the dimension structure of perceived advertising credibility using the EFA. After considering the pilot study results, eliminated 3 items and finally 27 scale items have been used to measure advertising credibility. Exploratory factor analysis (Maximum Likelihood) was done using varimax rotation and the items with loading above 0.5 are taken while items with low loading were dropped. To assess the internal consistency a reliability test was conducted. Following Nunnally's suggestion[17] it is ensured that for all the constructs the Cronbach alpha coefficients were greater than 0.70.

The KMO Measure was 0.940 and the Bartlett test was significant with $p< 0.001$. The Chi-square value of 14267.39 with 351 degrees of freedom affirmed the quality of data for further analysis and served as basis for factorization. The EFA provided four components with an 'Eigen value' greater than 1, which together explained over 54.013 percent of the variance. The items used to measure Advertising credibility is shown in Table 1.

Table 1: Measures of Advertising Credibility

Item Code	Items used in the advertising credibility scale
CC1	The Company has great amount of experience.
CC2	The Company is skilled in what they do.
CC3	The Company has great expertise.
CC4	The Company does not have much experience
CC5	The Company is honest.
CC6	I trust the Company.
CC7	The Company makes truthful claims
MC1	The information about the Product is Truthful
MC2	The health care communication is believable
MC3	The overall presentation of the matter is convincing
MC4	The communicated message is clear and understandable
MC5	The ad is informative
MC6	The content and presentation are ethical
MC7	The communication by the characters seemed unbiased
EC1	The persons appeared in the ad seems Trustworthy
EC2	The persons appeared in the ad seems Dependable
EC3	The persons appeared in the ad seems to be Honest
EC4	The persons appeared in the ad seems Reliable
EC5	The persons appeared in the ad seems Sincere
EC6	The persons appeared in the ad are knowledgeable
EC7	The persons appeared in the ad are Experienced
EC8	The persons appeared in the ad seems Qualified
EC9	The persons in the ad are Skilled
EC10	The persons in the ad seems Classy
EC11	The persons in the ad seems Elegant
EC12	The persons in the ad looks Attractive
EC13	The persons in the ad are Beautiful

After EFA the factor structure evolved with four dimensions. The 27 items used in the scale were classified into 4 dimensions such as Corporate credibility, Message-content credibility, Endorser credibility- Trustworthiness and Endorser credibility- Attractiveness which is given in Table 2. The single dimension endorser credibility is divided into two subgroups here –'trustworthiness of endorser' and 'attractiveness of endorser'. The themes behind the items were the basis for naming the factors. The factors extracted in each case are given in tables below with Cronbach alpha coefficients.

Table 2: Factors extracted after EFA

Sl. No.	Factor name	Items	No. of Items	Cronbach's alpha
1	Corporate Credibility	CC1, CC2, CC3, CC4, CC5, CC6, CC7	7	0.849
2	Message Content Credibility	MC1, MC2, MC3, MC4, MC5, MC6, MC7	7	0.837
3	Endorser Credibility-Trust worthiness	EC1, EC2, EC3, EC4, EC5, EC6, EC7	7	0.85
4	Endorser Credibility- Attractiveness	EC8, EC9, EC10, EC11, EC12, EC13	6	0.841

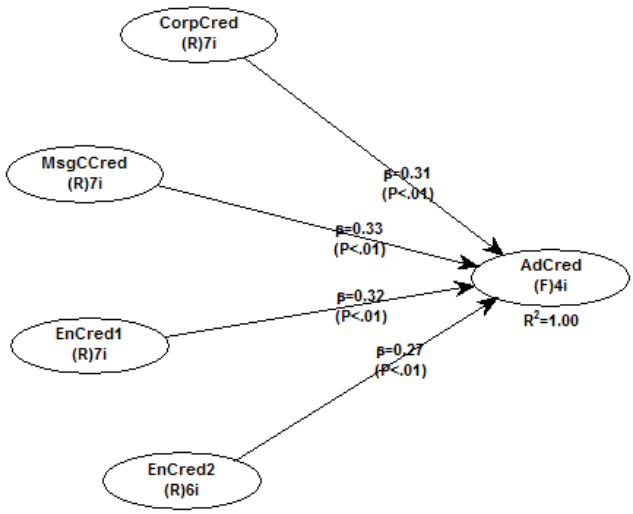

Figure 1: CFA Model - Advertising Credibility

Confirmatory Factor Analysis Using Warp PLS 5.0: The CFA was done to confirm the factor structure model of Advertising credibility construct. The main objective of conducting confirmatory factor analysis is to check the model fit ie., whether the predefined model is fit with the observed data. Confirmatory factor analysis tested the construct validity of Advertising credibility using Warp PLS 5.0 software as it is the most advanced research tool. The results for the measurement model of Advertising credibility showed an acceptable fit.

The various fit criteria are reported below: Average path coefficient/APC=0.308, P < 0.001 and Average R-squared /ARS=1.000, P<0.001 which was found significant. Average adjusted R-squared/AARS = 1.000, P<0.001. AVIF = 1.876 which is acceptable if <=5 and ideally <= 3.3. TenenhausGoF/GoF = 0.744, which should be >= 0.1, >= 0.25, >= 0.36 for small, medium and large effects respectively. Sympson's paradox ratio SPR=1.000 which is acceptable if >= 0.7, ideally = 1. R-squared contribution ratio (RSCR)=1.000 which can be accepted if >= 0.9, ideally = 1. The other fit criteria are given in Tables 4 and Table 5.

Table 3: Various Quality criteria for CFA Model

Advertising Credibility Dimensions	Composite Reliability Coefficients	Cronbach's Alpha Coefficients	Average Variances Extracted
Corporate Credibility (R)7i	0.886	0.849	0.527
Message Content Credibility (R)7i	0.877	0.837	0.506
Endorser Credibility-Trust worthiness (R)7i	0.886	0.85	0.527
Endorser Credibility- Attractiveness (R)6i	0.883	0.841	0.558

Table 4: Correlation among L.Vs. with square roots. of AVEs

Correlations among L.Vs. with sq. rts. of AVEs					
	CorpCre	MsgCCre	EnCred1	EnCred2	AdCred
CorpCre	0.726	0.648	0.539	0.435	0.719
MsgCCre	0.648	0.711	0.671	0.459	0.705
EnCred1	0.539	0.671	0.726	0.434	0.718
EnCred2	0.435	0.459	0.434	0.747	0.696
AdCred	0.719	0.705	0.718	0.696	0.807

Note: Square roots of AVEsare shown on the diagonals.

Results of CFA

The combined loadings and cross loadings ofevery indicator is significant as p-value is less than 0.05. P values less than 0.05 are desirable for reflective indicators. The indicator weights for latent variables are 0.314, 0.336, 0.318, 0.267 for corporate credibility, message-content credibility, endorser credibility-trustworthiness, endorser credibility-attractiveness, respectively.

The reliability of reflective constructs has been established as all composite reliability coefficient and

Cronbach alpha values were above 0.7. For formative constructs, reliability is not a crucial consideration. It is noticed that all average variance extracted values were > 0.5, p- values of the loadings were <0.05. The loadings were equal to or >0.5 and cross loading were <0.5. Thus, the convergent validity of reflective indicators is established. The convergent validity of the formative construct. Advertising credibility is also affirmed by observing that the corresponding AVE was > 0.5 and VIF found <0.5 for all formative indicators and weights were significant at p-value less than 0.05. Since the square root of the average variance extracted was higher than any of the correlations involving that latent variable, the discriminant validity also was confirmed.

Conclusion

Measuring and building credibility in advertising communication lessens consumer's doubt about the intension of marketers and enhances the advertising effects which will positively contribute to an increase in sales. This again will save the companies from the possible legal actions invited by the non-credible advertisements. The empirical investigation into the dimensionality of ad credibility after confirmatory factor analysis, revealed four ad credibility dimensions containing 27 ad credibility attributes.

The factor construction developed after EFA had items with adequate loadings and less conflicting cross loadings. All the 27 items could be classified into 4 dimensions such as Corporate credibility, Message-content credibility, Endorser credibility- Trustworthiness and Endorser credibility- Attractiveness. Almost all the dimensions identified as significant contributors to ad credibility. The CFA model of Advertising Credibility came out as good model with adequate fit and satisfied other quality parameters. This research contributes valid output to equip corporates and their ad agencies to assess the perceived credibility of their advertisement and to study its linkage with other brand related and purchase related variables. Based on such studies they can frame suitable advertising and marketing strategies. Since health is a sensitive issue, consumers are less willing to take risk and involvement in information search for healthcare products is more. This also highlights the need for a credible communication from society's point of view.

Ethical Clearance: The procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 (5).

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Association of Epicardial Adipose Tissue Thickness with Resting and Post-Exercise Cardiac Output in Overweight and Obese Individuals

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Abstract

Background: Epicardial adipose tissue is known to have adverse effect on local coronary health, cardiac structure and function. Echocardiography has shown to be a reliable method to measure the adipose thickness.

Aim: To study the association between epicardial adipose tissue thickness with resting and post-exercise test cardiac output.

Method: A cross-sectional study of 26 overweight and obese subjects in the age group of 20 to 50 was included. Epicardial adipose tissue thickness was measured using M-mode echocardiogram. Resting and post exercise cardiac output, ejection fraction and heart rate recovery were measured during sub-maximal exercise on treadmill.

Results: There was no significant correlation of epicardial adipose tissue thickness with resting and post-exercise cardiac output, ejection fraction and heart rate recovery.

Conclusion: Cardiac output, Ejection fractionat rest and post - exercise, also Heart rate recovery were not affected by epicardial adipose tissue thickness of less than 4 mm.

Keywords: *Epicardial adipose tissue, cardiac output, sub-maximal exercise test, body mass index, overweight and obesity, echocardiography.*

Introduction

Overweight and obesity are considered as major risk factors for cardiovascular diseases, diabetes, degenerative diseases and cancers.[1] There is an increase in morbidity and mortality resulting from obesity due to lifestyle changes in Indians.[2] Cardiovascular and metabolic diseases are found to be more prevalent in obese individuals with increased visceral adipose tissue.[3] Epicardial adipose tissue (EAT) is the fat located between the myocardium and visceral pericardium[4]. EAT is found to have influenceon local coronary artery health[5,6]. It is the true visceral fat depot of the heart. Increased amount of EAT is associated with abnormal cardiac morphology as it adds to the weight of the ventricles which may further restrict the contraction of

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heart and pumping ability[7,8]. EAT has been shown to be very closely related to intra-abdominal adiposity, a marker of entire body visceral adiposity, according to various magnetic resonance imaging studies. It is well known that visceral adiposity rather than subcutaneous adiposity is more responsible for health risks associated with fat deposition in humans.[9,10]

Even though the gold standard method to measure EAT thickness is MRI, echocardiography has shown to be a reliable method to measure the adipose thickness. Epicardial fat thickness is measured on a free wall of the right ventricle from both parasternal long–and short-axis views. The largest amount of epicardial fat is usually seen at this right ventricular free wall site. Epicardial adipose tissue is usually seen as an echo- free or if it is massive, hyper-echoic space.[11,12] Stroke volume can also be measured using echocardiography. Excess VAT has a detrimental effect on sub-maximal aerobic capacity.[13] Fick's principle states that VO_2 peak will occur when the maximal arterio-venous oxygen difference and the cardiac output (CO) reach their maximum during an exercise test.[14] Thus, VO_2 peak is directly related to the maximal arterio-venous oxygen difference and CO. CO has been recognized as the most important measurement in the assessment of cardiac pump function and overall hemodynamic function.[15] The influence of increased amount of epicardial adipose tissue thickness on the cardiac function is unknown. The aim of the study is to determine the association between epicardial adipose tissue thickness and resting and post-exercise cardiac output.

Method and Materials

A cross-sectional study of 26 subjects with convenience was conducted at Cardiology department, Kasturba Hospital, Manipal. The participants of age between 20 to 50 years with BMI $\geq$ 24.9kg/m^2, both male and female sedentary individuals (who exercise less than 3 Times/week) were included. The participants with any known respiratory and musculoskeletal conditions, those on regular medications were excluded from the study

Approval from the University Ethical Committee was obtained, following which a verbal advertisement was given among all staff and students of the constituent colleges of University. Participants went for a complete cardiac evaluation to rule out any undiagnosed cardiac conditions and then subjects were recruited as per the inclusion and exclusion criteria. A written informed consent was obtained from all the eligible subjects. Procedure was explained to the subjects and following data were documented: Age(years), height (cm), weight (kg), BMI (kg/m^2), body fat percentage and the baseline characteristics like EAT thickness(mm), Heart rate (bpm), Stroke volume (ml/beat), Ejection fraction(%) were measured in the left lateral decubitus position.

A single cardiovascular technician measured EAT thickness, SV using 2-D, B-mode echocardiography, with a Trans-thoracic, parasternal view [long – axis measurement of EAT thickness and apical 4- chambered method for stroke volume (which was calculated using the formula: end diastolic volume {EDV} – end systolic volume {ESV})]. And the EF was measured using M-mode parasternal long-axis view. Subjects were then allowed to walk on the treadmill for 2 minutes to familiarize the instrument. Then test was conducted on the treadmill according to stages of Balke protocol (as per mentioned in the appendices). Test was terminated when the subjects complained of fatigue or reached 75–85% of Maximum heart rate (HRmax).The termination criteria for the study include fatigue,onset of angina or angina-like symptoms,significant decrease in SBP of 20mm Hg or more,light-headedness, confusion, ataxia, pallor, cyanosis, nausea, or signs of severe Peripheral circulatory insufficiency,excessive increase in BP systolic >260mm Hg, diastolic >115mm Hg,0 also when subject requested to stop test for whatever reason and the equipment failure. Immediately after cessation of the test, subjects were made to lie on the left lateral position as before to measure SV and EF, within the first minute and simultaneously HRR was measured at 0, 1st, 3rd, 5th minute. The data was analyzed using SPSS version 19. Pearson's correlation was used to correlate EAT with BMI and body fat percentage, EAT with resting and post exercise cardiac output and ejection fraction, EAT with heart rate recovery. Heart rate recovery pattern was analyzed using repeated measures ANOVA

Results

There was a significant difference in the resting and post-exercise cardiac output. There was a moderate correlation between epicardial adipose tissue thickness and body mass index, but no significant correlation was found between EAT and total body fat percentage. There was a significant rise in heart rate during the first minute of recovery, but it did not return to baseline by the 5th minute of recovery. However, there was no significant correlation found between epicardial adipose tissue thickness and heart rate recovery.

Figure A: Procedure of echocardiographic measurement of EAT thickness, SV, EF (resting and post-exercise) in the left lateral decubitus position.

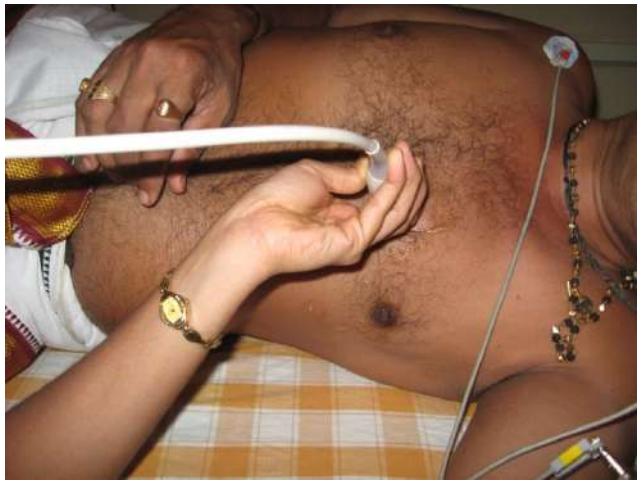

Figure B: 2-D, B-mode transthoracic Parasternal view, long axis measurement of EAT thickness.

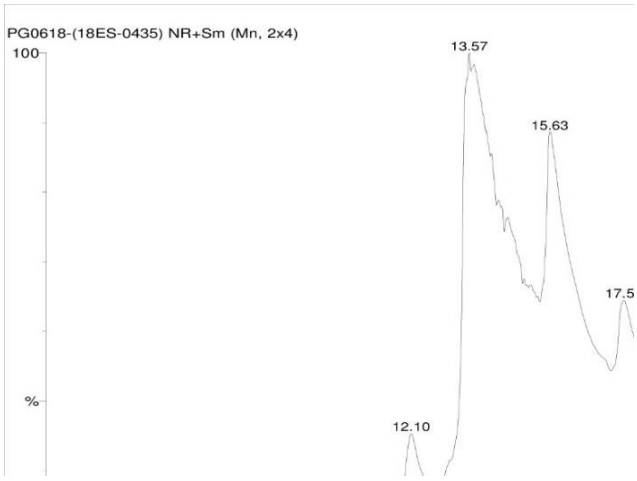

Figure C: B-mode echocardiographic, parasternal view, long axis measurement of EAT showing thickness of 3.9 mm (marked area).

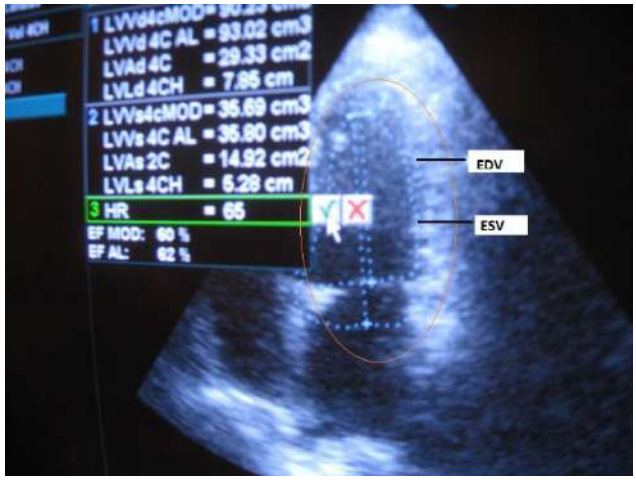

Figure D: Measurement of SV using and apical 4-chambered method (SV=EDV- ESV)

Table 1: Demographic characteristic of subjects from age group 20-50 years

	Mean ± SD (n = 26)
Age (Year)	27.46±8.78
BMI (kg/m^2)	30.16±4.41
Body fat Percentage	38.35±5.6
EAT Thickness (mm)*	2.58±0.447

°BMI – Body Mass Index *EAT- Epicardial Adipose Tissue

Table 2: Comparison of resting and post-exercise cardiac output and ejection fraction

	Resting (L/min) Mean ±SD	Post-exercise (L/min) Mean ±SD	p value
Cardiac output	3.30±0.8	6.8±1.8	<0.05
Ejection fraction	66.5±3.6	74.5±2.9	<0.05

Table 3: Correlation of BMI and body fat percentage with epicardial adipose tissue thickness

	r	p value
BMI & EAT	0.424	0.015
Total body fat % and EAT	0.183	0.186

Discussion

This study was conducted to determine the influence of EAT thickness on cardiac function. Increased amount of EAT is known to have a potential active role in the development of cardiovascular and metabolic disorders.[16] But whether excess amount of EAT thickness influences the cardiac function is not known.

In the present study, we investigated the influence of EAT thickness on CO, EF and HRR. We found that all the participants in the present study were under the categories of overweight and obese (Class 1 & 2) Indian subjects. The EAT values obtained in the present study were relatively low (1.9mm - 3.9mm) [n = 26] in comparison with African American (n = 50) & Non – Hispanic white (n=106) population (6.7- 8.9mm).[17, 18] We found a moderate correlation between overweight as well as class 1 and class 2 obesity with EAT thickness. We could not study the subjects in class 3 obese category.

In our study, a linear increase in the resting and post-exercise cardiac output and ejection fraction was found. It is known that the aerobic capacity is directly proportional to cardiac output and arterio-venous oxygen difference.[19] It has been shown that higher cardiac output in response to exercise testing in overweight people compared with normal –weight people may be explained by higher stroke volume. It is also shown that large differences in VO_2 peak values in general population are due primarily to large differences in maximal stroke volume.[20, 21]

EAT can substantially modulate the cardiac morphology and function.[22] Ejection fraction and stroke volume are good indicators of cardiac function. In this study we found no significant correlation between EAT thickness less than 4mm and resting and post-exercise cardiac output and ejection fraction. We did not find literature on association of EAT thickness with cardiac output and ejection fraction.

Heart rate recovery is a predictor of future cardiovascular events and indicates the autonomic function of the body.[23] We found no significant correlation between EAT thickness and HRR. HRR in the first minute was dropped by more than 20 beats per minutes (mean HRR was 28 bpm), indicating normal autonomic function. However, baseline values were not achieved within the fifth minute. In the study conducted by Kim et al, there was a blunted heart rate response in the 1- and 2- minute of recovery. And the cardiorespiratory fitness which was assessed as VO_2 peak was also reduced in obese men.[24] This study suggests that EAT thickness of less than 4mm does not affect the cardiac function and aerobic capacity was not affected by EAT thickness in overweight, as well as class 1 & 2 obese subjects.

The exact relationship of EAT thickness with cardiac output could not be established because of small sample size and also because of EAT thickness was not more than 4mm. Further studies are required to focus on larger sample size with wider age group distribution. Future research should include all categories of overweight and obesity. There was no significant correlation between epicardial adipose tissue thickness and resting and post-exercise cardiac output. Cardiac output, Ejection fractionat rest and post - exercise, also Heart rate recovery were not affected by epicardial adipose tissue thickness of less than 4mm.

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Conflict of Interest: The authors hereby declare that there is no conflict of interest with regards to the content in the mansucript.

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The Effectiveness of Health Belief Model as an Educational Intervention in Improvement of Oral Hygiene: A Systematic Review

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Abstract

Background: A lot of health education and promotion theories have been put forward for behaviour counselling of patients in a dental operatory. Among these, the Health Belief Model is one of the oldest theories that stats that a person's beliefs and attitudes determine the likelihood of a behaviour change.

Aims and Objectives: A systematic review was conducted to assess the effectiveness of a Health Belief Model based educational intervention in improving the oral hygiene status.

Method: An electronic database search was conducted in the months of September 2018 to November 2018 using the keywords of Health Belief Model (HBM), gingivitis, periodontitis and dental caries. Research papers and original articles using a randomized controlled trial design with assessment of oral health status through any standard indices such as DMFT, Plaque Index (PI), Periodontal pocket depth were included in the review. A total of 41 abstracts appeared, after initial screening, duplicates removal, final screening based on the inclusion criteria for the review and full-text availability of articles, a total of five articles were included in the review.

Results: All the five trials using the Health Belief Model as an educational intervention reported an improvement in the oral hygiene status of study subjects in the intervention group which was significantly different to those in the control group.

Conclusion: The Health Belief Model can be regarded as a useful educational tool to change behaviours and help in the development of behaviours that are conducive for the maintenance of good oral health. Further research is warranted to supplement the evidence that already exists to provide a clearer evidence of the usefulness of Health Belief Model in health education and health promotion.

Keywords: *HBM, dental caries, oral health, gingivitis, periodontitis.*

Introduction

The Health Belief Model developed by Irwin Rosenstock in 1966 is one the oldest health promotion theories that explained the association between health beliefs and behaviour.[1] It was conceptualized based on the reasons people gave for why they accepted or declined an X-ray examination to detect the presence of tuberculosis. This theory holds that a person's behaviour is based on six constructs of the health belief model

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which are perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy and cues to action.

A person's subjective belief of whether he is susceptible to a condition or health threat, the severity of the threat, the benefits that would be accrued by adopting a recommended behaviour change, the barriers that would likely be encountered in adopting the behaviour change, the degree to which people believe that personal actions will have an effect on a health outcome, and triggers to effect a health behaviour such as mass media campaigns, advice from physicians etc., act in combination to bring about a behaviour change in individuals.[2]In a nutshell, people engage in a cost benefit analysis and then decide to adopt or not adopt a new behaviour.

Thus far, cross-sectional studies have shown a good correlation between oral hygiene behaviours and health belief model.[3] Likewise, various constructs of the health belief model have also been found to be a good predictor of dental health behaviours in studies.[4]

This review was conducted to assess the effectiveness of health belief model as an educational intervention in the improvement of oral hygiene.

Method

Objectives: To assess the effectiveness of health belief model as an educational intervention in oral hygiene improvement

Inclusion Criteria:

Original articles

In-vivo studies

Randomized controlled trials

Articles done on the effectiveness of HBM as an educational intervention in improvement of oral hygiene

Articles with full-text access

Exclusion Criteria:

Review articles

Articles without open access

Studies done on HBM's effectiveness in changing general health behaviours.

Results

The literature search yielded 41 abstracts, out of which 15 were related to the research question. Of these articles, a total of six articles with full text access were included in the final review. Figure 1 represents the flow diagram of the research papers that were searched, identified, screened, assessed for eligibility and included or excluded in the review based on the inclusion and exclusion criteria for the review.

Table 1 shows the characterization of bias in all the five studies included in the review. Most authors had not presented sufficient information in their article for a proper bias assessment. The characterisation of bias was made according to PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) guidelines for randomized controlled trials.

Table 1: BIAS Analysis of the Included Studies

Studies	Random Sequence Generation	Allocation Concealment	Blinding of Participants and Personnel	Blinding of Outcome Assessment	Incomplete Outcome Data	Selective Reporting	Other Biases
Wickremasinghe et al (2017)[5]	?	?	?	?	-	?	?
Shahnazi et al (2014)[6]	?	?	?	?	-	?	?
Solhi M et al (2010)[7]	?	?	?	?	+	?	?
Shahnazi et al (2016)[8]	?	?	?	?	-	?	?
Rivandi SH et al (2017)[9]	?	?	?	?	+	?	?

+ High risk, - Low risk, ? unclear risk of bias

Discussion

The cornerstone of the Health Belief Model (HBM) is that health perceptions affect health behaviours. Most studies conducted on the HBM, ascertain only the improvement in patient perceptions and oral health behaviours after an educational intervention, rather than reporting on whether an educational intervention led to any changes in the oral health status.[10-13] Hence, articles for this review were exclusively chosen only if they had reported on the oral health status using intra-oral examination as one of the components of the study.

After electronic database search, screening and retraction a total of five articles with full- text accessibility was included in this review. The first study was conducted by Wickremasinghe et al (2017) on 15-year-old children in Kellage district, Sri Lanka. The study sample was randomized into three groups with 208 members in each group, two groups served as control and one group served as the intervention group. The primary outcomes of plaque scores and bleeding on probing were found to be significantly different when comparisons were made pre and post educational intervention in the intervention group.[5]The strength of this study is that it used a didactic educational intervention in the control groups rather than no intervention. Hence, a comparison could be made between a traditional educational intervention and HBM based intervention. On such comparison, the HBM based educational intervention was found to perform better.

The weaknesses of this study are that sufficient information was not presented by the authors to ascertain the risk of bias in the study. Further, as this was a study with a follow-up period of six months there were some losses to follow up which resulted in a low-risk of bias due to incomplete data in the bias analysis.

The second study included in this review was conducted by Shahnazi et al on 56 mothers of 3-6-year-old children. The primary outcome of interest in this study was the improvement of oral health status of children following HBM based education of the mothers. In this study, the dental plaque scores of children as measured by Navy Plaque Index was found to be significantly different in the intervention and control groups after a one-month interval.[6]

The strength of this study is that, it incorporates the elements of other behavioural theories such as the Precede-Proceed model and Theory of reasoned action, which state that behaviour modification is not only based on internal factors but also external factors with "important others" playing a major role in influencing behaviours.[14-16] Primary care-givers' knowledge and attitudes have been determined to be a predictor of oral health of children in many studies.[17,18]. The weakness of this study was that sufficient information was not presented by the authors to ascertain the risk of bias in the study. Also, no attempt was made to evaluate whether a HBM based intervention affected the oral health status of the mothers participating in the study. The response rate was found to be 100% at the end of the study period with no losses to follow up. This resulted in an ascertainment of low risk of bias due to incomplete data in this study.

The third study included in this review was a study conducted by Solhi M et al (2010) on 291 twelve-year-old school children. The main outcome of this study was a reduction in mean DMFT and OHI in the HBM based intervention group at the end of six months in comparison to the control group which showed no improvement in DMFT or OHI.[7] There were considerable limitations in this study, one of which was substantial losses to follow up which led to the classification of high risk of bias due to incomplete data. Also, the methodology presented by the authors was not sufficient to ascertain the risk of other biases in this study.

The fourth study included in this review was a study conducted by Shahnazi et al (2016) on eighty-eight women in their first trimester of pregnancy. It was postulated that pregnant women were a vulnerable group prone to developing oral diseases due to a number of reasons including but not limited to hormonal changes and nutritional deficiencies.[19,20]The primary outcome of this study was that the DMFT status of pregnant mothers in the HBM intervention group remained unchanged at the four months follow up period whereas there was an increase in DMFT status of pregnant mothers in the control group.[8]The weakness of this study was that the mean DMFT was assessed at the four months follow up period for mothers in intervention and control group but no other covariates that could have confounded the study results were assessed. This study had a 100% response rate at the end of the study period and hence it could be ascertained that bias due to attrition could not have occurred in the present study. There was not sufficient information provided by the authors to ascertain other kinds of biases in the study.

The last study included in this review was a study done by Rivandi SH et al (2017) on 196 30-60-year-old outpatients attending a dental clinic in Tehran, Iran. The patients were randomized equally into a HBM based educational intervention group and control group. The primary outcome observed in the study was a reduction in microbial plaque scores and periodontal pocket depth at the one-month and three-month follow up in the HBM intervention group which was statistically significant in comparison to the control group.[9] There was a considerable loss to follow up at the third month interval in this study which led to the ascertainment of a high risk of bias due to incomplete data. The authors did not present sufficient information to ascertain risk of other biases in the study.

In this review, it was found that all the five studies unanimously reported an improvement in oral health status following a HBM based educational intervention in comparison to control groups which received alternate or no intervention. The limitation of this review is that all the five articles assessed did not provide enough information to judge the risk of most biases. Even so, this review can act as sufficient evidence as all the randomized trials included in this review showed an improvement in oral health, as shown by an improvement in standard indices measuring dentition status or periodontal status in the study subjects included in these trials. Further research with HBM based educational intervention is warranted to understand whether health education based on a theoretical model is more effective than traditional or routine method of health education.

Conclusion

A systematic review was conducted to assess the effectiveness of a theory-based approach of health education using the Health Belief Model in improvement of oral health status. However, bias ascertainment could not be done properly with the information presented by the authors and hence this review can be taken as moderate evidence for the effectiveness of HBM based health education.

Ethical Clearance: The ethical clearance for this study was obtained from the Institutional Review Board of SRM Dental College and Hospital.

Conflicts of Interest: Nil

Financial Support: Nil

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Marriage Trajectories among Patient with Mental Health Problem

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Abstract

Objective: To explore effect of mental illness on marriage and marital life among the tribal Patient with Mental Illness (PMI).

Method: To achieve the objective of the study, qualitative method with multiple case study has been adopted.

Population and Sampling Technique: Population is a tribal Person with Mental Illness (PMI) and Purposive Sampling Technique is used.

Findings: The analysis has been categories into two broad areas, that is, effects of mental illness among married patient and unmarried patient with mental illness. Results indicate that, there is an adverse effect of mental illness on marriage and marital life among the patient with mental illness.

Conclusion: Marriage and mental health problems are closely related and multi-faced one. The evidence shows that, there is an adverse effect of mental illness on marriage and marital life among the tribal patient with mental illness.

Keywords: *Marriage, Mental Illness, Marriage Trajectories, Marital Life, Tribal*

Introduction

Everybody will have aspirations in their life. Marriage is one among them. In general, Marriage is a union between a man and a woman for the rest of the life. They are united not only physically, but psychologically, and socially too. The united souls now form a family. Marriage is considered as a sacred religious obligation between heterosexuals that admits individual into a family life[1]. It gives more balanced to individual's lives through establishing an enduring and continuing bond between husband and wife. It helps in solving and reducing emotional, psychological, economical and other problems[2]. So marriage is not only gratifying the sexual needs of the individuals but also helps the individuals in achieving the personality maturation through psycho-social status.

If any one of the spouse becomes mentally ill, there comes the problem in the union. If the problem is more, then the gap between them will be more. Sometimes it may result in break of the union also. There is an adverse effect of mental illness on the marriage and marital life among the patient with mental health problems[3-5]. Even there is positive association between mental illness and subsequent divorce also[4]. Different legislatures on marriage also have certain constraints on the marriage of person having mental health problems. In Hindu Marriage and Special Marriage Acts, marriage became voidable in the presence of severe mental illness[6]. Because the impact of illness will decrease the social abilities from successful marital life. Marital discord is one of the consequences among people having chronic mental health problems[7]. Behere, Rao and Verma (2011) have mentioned that, mental illness and problems in marriage are closely associated. Even patient with

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mental illness is considered as a burden to the spouse[8].

When compared to men, if the woman in a family is educated, then the family will blossom. The same is in the case of illness. When compared to men, if the women in a family fell in ill, then the family will be affected more. Among the spouses, if the women are affected, then the trouble is more. The condition for married women having mental illness is very worst as they are sent back to their natal homes, divorced, or in the form of abandoned[9-10]. In Indian society, the expectation of a married woman is different from natal house to in-laws house[10]. In Indian marriage system, the severity notion of suffering is more when women married a mentally ill man than men married a mentally ill women[10]. Studies show that, constant neurotic behaviour of the patient creates a marital tension to the spouse and increase the alienation among them[11-12].

Mental illness also reduces the probability of getting married. Pre-existing mental illness reduce the chance of marriage along with in delaying the marriage process also[4, 9]. Low marital rates have been reported among the patient with mental health problems from the several studies[9]. In case of schizophrenia, patients are more likely to be staying alone or unmarried[7].This piece of research tries and find how mental is related to prosperity of marriage and the married life.

Objective of the Study: The present research explores the impact of mental illness on marriage and marital life among the tribal patient with mental illness.

Materials and Method

Study Design: The study is based on qualitative design with multiple case study method. Qualitative methods are more suitable for understanding the phenomenon of mental illness, as it focuses on the experience of the subjects.

Study Area: The purposed study has been carried out in the institutional setup. The researcher has selected the Department of Psychiatry, Ispat General Hospital (IGH), Rourkela, Odisha. IGH is a multi-speciality hospital located in the sector 19 of Rourkela city. The hospital was setup and administered Rourkela steel plant.

Study Population and Sampling: The present study has fifty cases of tribal people with mental illness. The sampling procedure had followed the 'purposive sampling' with inclusion and exclusion criteria. **Inclusion Criteria:** Following are included: Gender of the sample is both male and female; the age group is from 18 and above who is diagnosed with any form of mental disorder as per International Classification of Disease (ICD) 10; Currently admission in the hospital (In-door patients). **Exclusion Criteria:** Following are excluded: Outdoor patients (OPD); Refused to give the information; Mental retarded persons.

The key subject of the study is tribal person with mental illness. Since the subject is affected with mental illness, their cognitive ability may be reduced and the information provided by the patient may be incomplete. In order to get the in-depth information, it is required to collect the information from the family members or care givers also.

Data Collection procedure: Data sources for the study include the interviews with the tribal patient with mental illness. Data collection for this study consisted of face to face structured interviews with fifty patients and their family members / care givers. The researcher conducted interviews between June 2015 and May 2016. The mean duration of personal interview is 56.74 minutes with range of 22 minutes to 150 minutes. A specially designed interview schedule was used to collect the information. The interview process has conducted with one case in several times as per the availability of the respondent, the family members / care givers, time and their mood.

Ethical Consideration and confidentiality: The proposed study has been approved by the Ethical Committee Review Board (ECRB) of Ispat General Hospital (IGH), Rourkela, India. All the information including personal identifications shared by the respondents have been kept confidential; only the average information has been used for the research purpose.

Data Analysis and Interpretation

Socio-demographic details of the responded: The representation of male and female proportion is 28 (56%) and 22 (44%) respectively. The age of the patients with mental illness ranged from 18-72 with the mean age of the sampling 36.34. Majority of the sample (56%) belongs to the age group of 21-40. 64% respondents with mental illness are married while 36% respondents are unmarried. The unmarried age ranges from 18 to 40.

Impact of Illness on marriage and marital life of the patient with mental illness

The impact of mental illness on marriage and marital life among the patient with mental illness has been categories into two broad areas i.e. effects of mental illness after marriage and before marriage. As a result, the respondents are divided into two broad categories: married (64%) and unmarried (36%). The married category again divided into three types, namely: normal, disturbances, and divorce or separated. Likewise unmarried category has divided into four types: not attend the marriage age, not to marry, wait till the recovery of the illness, and worry about the marriage.

Impact of illness on Marital Life: Data representing on impact of illness on marital life shows that, out of 64% married PMI, 42% represents a normal marital life without any marital discord, 12% respondents have family discord and rest 8 % are divorced or staying separate.

Normal: In most of the married patient those have reached their adult hood or/and late adult hood stage, they don't have marital discord. They are trying to cope up with the situation and manage the illness along with their family members also. And in the rest of the case, where the partner is cooperative they are also maintain the balanced marital life and try to control the illness. In case of married female, where the husband and other in-laws members are cooperative, in that case family life going smooth and normal. Family support is the main reason to maintain normal life for the patient with mental illness.

Disturbances: The researchers found below mentioned reasons for the marital discord among PMI. In case where the partner is not supporting or not understanding the situation about the patient, the disturbances have started. The interference of the in-laws members or not getting support from them is also creating marital discord among the female patient and husband. If the male person is consumes alcohol during the medication is the main reason for the family disturbances. The researchers also found some other reasons like lack of proper sexual relationship, dubious attitude towards the partner, create the disturbances. These are the causes are the symptoms or side effects of the illness or psychiatric medicines.

Divorce/separated: The main reason for the divorce or separated is, where the patient (male) is not leaving alcohol and it has its subsequent negative effects to the family and the children. In that case wife is staying separately for the better future of the children with a peaceful and dignified life.

Impact of Illness on Marriage among Unmarried Patient: Data representing on impact of illness on marriage among unmarried patient shows that, 8% not attended marriage age, another 8% responded not to marry, yet another 8% reported that they wait till recovery of the illness, and worry about the marriage represents for 16% sampled population.

Not to marry: Three important reasons found by the researchers for 'not to marry'. The family members of the PMI don't want to spoil another (partner) life. Sometimes, it is believed by the patient and the family members that, the patient may suffer after marriage, if the partner may not able to cope with the patient. In some cases, though family members are interested for marriage but the patient don't want to go for marriage because s/he doesn't want loose the freedom of another human being.

Worry about the marriage: For most of the male cases where age is not reaching the marriage age or nearly about to marriage age, the family members are ready to wait till recovery of the illness. But in the case of female attending the marriage age, it is creating headache to the family members.

Discussion

Evidence from the data shows, there is high impact of mental illness on marriage and marital life among the PMI. This finding is supported by the findings of the existing study[13].The present research also shows that, in adulthood and in late adult hood, the marital life is normal. Research conducted by Miller et al.[14] shows that, mental disorders are positively associated with the marital disputes but for later age populations it is negatively associated. Another research which supports the same is by Oltmanns and Balsis (2011) which states that Well-being in long-term marriages seems to be influenced by factors that are somewhat different from those factors that have been identified in younger couples[15]. Mental illness is a risk factor for both marriage and marital life. Nambi (2005)[9] has mentioned that, alcohol addict is one of the prominent cause of family disturbance among the substance user's patients. So, high rate of divorces and family disturbances are virtually inevitable among families with alcohol addicts due to high incidence of

domestic violence[16].

16% of the samples are worried about their change of getting married. This report is supported by the two findings. a. Pre-existing mental illness having worsen condition for marriage and reduce the chance of marriage (Behere et al., 2011; Nambi, 2005).b. Premarital mental health problems are associated with lower likelihood of ever marrying (Breslau et al., 2011).

Limitations: The study has focused only limited sample size due to time constraint.

Conclusion

The authors conclude that, marriage and mental health problems are closely related and multi-faced one. The evidence shows that, there is an adverse effect of mental illness on marriage and marital life among the tribal patient with mental illness. Mental health problems are working as conflagration in marriage and marital life in the Indian marriage system. So, further extensive and large sample empirical studies are to be undertaken to understand the severity of the problem.

Conflict of Interest: No

Source of Funding: The first author is enrolled in PhD programme at the National Institute of Technology Rourkela, Odisha, India

Ethical Clearance: Yes, Ethical Committee Review Board (ECRB) of Ispat General Hospital (IGH), Rourkela, Odisha

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Revalence of Goiter and its Association with Consumption of Iodized Salt among School Children, in a Rural Area, Tamilnadu

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Abstract

Background: Iodine Deficiency Disorders is a significant public health problem all over the world.Iodine is essential element for thyroid function, necessary for normal growth, development and functioning of brain and body. **Objectives:**To estimate the prevalence of goiter among school children and to assess the prevalence of useof iodized salt. **Material and Methods:** A Cross sectional study conducted among Children between 6-12 years of ageinMappedu area.A pre-tested questionnaire, Rapid test kit to find iodine content of salt and clinical examination to assess goitre was done for the study subjects.The sample size calculated was120.Dataanalysis:Proportions and chi-square was used for analysis. **Results:** 65% were using iodized salt and remaining 35% were using non-iodised salt.The prevalence of goiter was found to be 17(14.2%).**Conclusion**:One-third of children and their family were not consuming adequately iodized salt. The consumption of iodized salt is still less in the community and Iodine Deficiency Disorders continue to be a public health problem.

***Key words**: IDD, Goiter, Iodized Salt, Rapid test kit.*

Introduction

Iodine Deficiency Disorders is known to be a significant public health problem all over the world. Iodine is essential element for thyroid function, necessary for normal growth, development and functioning of brain and body.Iodine deficiency is known to cause endemic goitre.[1]

Salt iodization programs is being implemented in many countries of the world for more than five decades ,currently only two-thirds of the global population (71%) is estimated to be covered by iodized salt, while the rest (31%) of the world population have insufficient iodine intakes, with the most affected WHO regions being South-East Asia and Europe.[2]

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Iodine deficiency disorders are estimated to result in loss of 2.5 million disability adjusted life years (DALYs) (0.2% of total globally).[3]In India it is estimated that more than 71 million individuals suffer from Iodine Deficiency Disorder, while another 200 million people stay in iodine deficient areas.[4]The Iodine Deficiency Disorder control goal in India was to reduce the prevalence of IDD below 10% in the entire country by 2012.[5]

In Tamil Nadu, the IDD control cell was established with Central Government assistance and is functioning since 1st July 1994.Goiter surveys and resurveys of all the districts are being carried out periodically since 1991. According to National Family Health Survey (NFHS)-4 in Tamil Nadu proportions of households using iodized salt is 82.8%.TotalGoitre rate is reported as 13.5% in Tamil Nadu.[6]

Although the importance of iodized salt and its usage has increased in the community,Iodine deficiency poses a threat to health, wellbeing and economic productivity of the community.Progress toward the elimination of Iodine Deficiency Disorder can only be demonstrated if

it is measured.

Monitoring iodine levels of salt and iodine status of population are the two important components of Iodine Deficiency Disorder program monitoring, hence the study has been conducted.

Objectives

1.To estimate the prevalence of goiter among school children in rural area.

2.To assess the prevalence of use of iodized salt among them .

Methodology

A cross sectional study was conducted in Primary School,Mappedu between May 2018 – July 2018. Children between 6-12 years of age were selected by using Simple Random Sampling method. The sample size of 120 was calculated by using 76.2% of households residing in rural area were using iodized salt.[7]Using a pre-tested questionnaire,details regarding edible salt used within the family was obtained. Children were asked to bring 1-2 teaspoon of salt which is used for cooking purpose at their home in a sealed plastic bag and Iodine content in salt wasestimated using Rapid Test Kit.

Children were clinically examined for the presence of enlargement of thyroid gland.Children who were not present in the school at the time of data collection and those who are not willing to participate were excluded from the study. Data was entered in MS Excel. Proportions and chi-square were used for data analysis.

Salt Sample Collection & Testing:

One teaspoon of salt was obtained from each household for testing purposes.Rapid test kit was used to estimate the iodine content of salt. [8,9,10]

- One to two drops of the test solution was put on the salt sample,if the colourchanged from white to blue/ purple, indicated the presence of iodine to threshold of 15ppm.
- For alkaline salt samples or salt with high moisture content, one drop of recheck solution followed by starch solution was used to test the presence of iodine in salt.

Clinical Examination:

Enlargement of thyroid gland was assessed and presence of goiter was graded as per WHO guidelines. [6,11]

- Grade 0: Thyroid gland was neither palpable nor visible/ no goiter.
- Grade 1: A mass in the neck that is consistent with an enlarged thyroid that is palpable but not visible when the neck is in normal position. The mass moves upwards with deglutition/goitre palpable not visible.
- Grade2: A swelling in the neck that is visible when the neck is in normal position and consistent with enlarged thyroid when the neck is palpated/goiter visible and palpable.

Operational Definition For Iodised Salt:

Iodised salt is defined as one which contains iodine content of ≥ 15ppm at the household level as determined by Rapid Test Kit.[12,13,14]

Results

120 children participated in the study, they belonged to 6-12 years age group mean age was found to be 9.14 years. Majority of them (50.8%) were using powdered form of salt. 80% of the study population were storing salt away from the fire.More than 90% of respondents have kept the salt in closed container.Majority of the households have bought packed type of salt 88.3% while 11.7% were found to purchase unpacked type of salt. (Table-1)

Table 1: Background Characteristics of Study Subjects (N=120)

Background Characteristics of the study subjects (N = 120)			
S.no	**Characteristics**	**(N)**	**(%)**
1	AGE		
	6 years	18	15.0
	7 years	15	12.5
	8 years	14	11.7
	9 years	16	13.3
	10 years	18	15.0
	11 years	20	16.7
	12 years	19	15.8
2	FORM OF SALT		
	Powdered	61	50.8
	Crystalline	59	49.2
3	PLACE OF KEEPING THE SALT		
	Kept near fire	24	20.0
	Kept away from fire	96	80.0
4	TYPE OF SALT BOUGHT		
	Packed	106	88.3
	Unpacked	14	11.7
5	STORAGE OF SALT		
	Open container	8	6.7
	Closed container	112	93.3

All the 120 children brought the salt samples from their houses. On testing the salt samples with Rapid Iodine testing kit 65% of the samples colour was changed to blue which indicate the presence of iodine≥15ppm.(Table-2).

Table 2- Distribution of iodized salt among study participants.

Iodine Content of Salt	**N**	**(%)**
Non-Iodized	42	35.0
Iodized	78	65.0
Total	120	100.0

Among the salt samples which the participants told they buy packed salt 70.8% were found to be iodised. While only 21.5% of unpacked salt was iodised. This difference was found to be statistically significant. (Table-3)

Table 3- Association between iodine contentof salt and types of salt.

Type of salt	Iodized (%)	Non-Iodized (%)	TOTAL
Packed	75(70.8)	31(29.2)	106
Unpacked	3(21.5)	11(78.5)	14
Total	78(100)	42(100)	120

*Chi square:13.225,P value: 0.000 ***P<0.05 is considered as significant.**

In the present study 61 salt samples were in powdered form and remaining 59 were crystalline. 70.5% of powdered salt was found to be iodised while 59.3% of the crystalline salt was iodised.This difference was not found to be statistically significant.(Table-4)

TABLE 4- ASSOCIATION BETWEEN IODINE CONTENTOF SALT AND FORM OF SALT.

Form of salt	Iodized(%)	Non-Iodized (%)	TOTAL
Powdered	43(70.5)	18(29.5)	61
Crystalline	35(59.3)	24(40.7)	59
Total	78(100)	42(100)	120

Chi square: 1.644,P value :0.199. ***P<0.05 is considered as significant**

Clinical examination was done among school children, the presence of enlargement of thyroid was checked and grading was done as per WHO guidelines. Goitre was diagnosed in 17 children. The prevalence of goiter was found to be 17(14.2%). Among those 17 children, 15(12.5%) of the children were found to have grade 1 and 2 children (1.7%) were found to have Grade 2 Goiter.(Table-5).

TABLE 5- DISTRIBUTION OF GOITREAMONG THE PARTICIPANTS

GRADING OF GOITER	N	(%)
G0	103	85.8
G1	15	12.5
G2	2	1.7

Among 17 children who were clinically diagnosed to have goiter, 16 (94.2%) were not consuming iodised salt while only 25.2% children without any signs of clinical goiter were not consuming iodised salt. The difference was found to statistically highly significant.(Table-6)

TABLE 6- ASSOCIATION BETWEEN IODIZED SALT AND GOITER AMONG STUDY PARTICIPANTS.

Iodine Content	Goitre Present (%)	Goitre Absent (%)	Total
Non-Iodized	16(94.2%)	26(25.2%)	42
Iodized	1(5.8%)	77(74.8%)	78
Total	17(100%)	103(100%)	120

*Chi square:30.42,P value : 0.000 ***P<0.05 is considered as significant OR= 47.**

Discussion

This study was carried out to assess the utilization of iodized salt in the rural community and prevalence of Clinical goiter.In the present study only 65% of the participants were consuming iodized salt which was less than reported by NFHS 4 in rural Tamil Nadu 76.2%.[7]

In our study 49.2% of the participants were using crystalline form of salt and 11.7% were getting unpacked salt.

The prevalence of goiter was found to be 14.2% in our study which was found to be similar to the results of national level survey data conducted by ICMR where the goiter prevalence was 14.1% (5-14 years age group).[15]Chandrakant et al reported 13.5% of school children showed enlargement of thyroid gland.[6] Zargar et al reported a higher prevalence of goiter30.2 % in children less than 6 years old and 50.6 % in children greater than 12 years old in Kashmir.[15]

In the present study all except 1 child who were diagnosed to have clinical Goiter were not consuming iodised salt. Odd's Ratio was found to be 47, this shows all those who were not consuming iodised salt were at 47 times greater risk of getting Goiter. Goiter is just one of the clinical manifestation of Iodine Deficiency Disorders,IDDs can also manifest as mental retardation, still birth, abortion, deafness, mutism, squint and neuromotor defects.[16]

More number of packed and powdered salt samples were found to be iodized in comparison to unpacked and crystalline salt. Indian government has issued the notification on banning the sale of non-iodised salt for direct human consumption in the country in May 2006 under the Prevention of Food Adulteration Act 1954.[17] In the present study one third of the families are found to consuming non-iodised salt. Therefore Government should take necessary actions to check the sale of unpacked salt and non-iodised crystalline salt in the market.

Conclusion

One-third of children and their family were not consuming adequately iodized salt. National Iodine Deficiency DisordersControl Programmewas startedfifty years back, but the consumption of iodized salt is still less and Iodine Deficiency Disorders continue to be a public health problem. Hence health education regarding Iodine deficiency disorders and adequate utilization of iodized salt is the need of the hour. Strict actionsshould be taken on the sale of non-iodised salt to have significant impact on the health and well-being of the country.

Limitation: The Urinary iodine excretion level was not estimated in this study.

Conflict of Interest:nil

Source of Funding:nil

Ethical Clearance: Ethical approval was obtained from the Institutional Review Board (IRB) and Institutional Ethics committee. Written informed consent was obtained from the parents of the study participants and information sheet regarding the study was given to all the participants.

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E-waste: The Serious Health Hazard

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Abstract

Science and technology have led to production of many electronics and electric tools and equipments starting from 18th century. Especially twenty first century is characterized by change in traditional habits and customs and adoption of modern technologies in all around the works and activities of the world. Electronic gadgets are meant to make our life happy and smooth functioning. These electronic gadgets have penetrated every aspects of our life. Frequent change of television sets; computers and mobile phones become the general habit of majority individuals in the world. We like to keep ourselves updated with the current scientific advancements. In all such a situation we never think about appropriate recycling of old electronic equipments. We frequently throw out the old electric items and usually become interested to purchase updated new items. Electronic wastes (e-waste) are increasing all around the life and works of human being. Each unit of e-waste may create every types of hazardous situation especially the health related. Electrical equipments contain toxic substances and their disposal and recycling becomes a question of health nightmare. Paper discussed definition, types and all about the health hazards of e-waste. Paper also explained little about the recycling of e-wastes in India.

Keywords*: E-waste, Hazards, Human Health, Recycling, Technology, etc.*

Introduction

Advances in science and technology have led to production of many electronics and electric tools and equipments starting from 18th century. More specifically 21st century is characterized by change of traditional habits and customs and adoption of modern technology along with luxurious tools or equipments. All electronic gadgets are meant to make our lives happy and smooth functioning. These electric gadgets have penetrated every aspect of our lives. Frequent change of television sets; computers and mobile phones become the general habit of every individual. Some times to make ourselves updated with the current scientific advancements we also become bound to change our electronic items. In all such situation we never think about reuse or appropriate recycling of old electronic items. We frequently throw out the old electric items and purchase regularly the updated new items. In that way electronic wastes (e-wastes) are increasing day by day in every walk of works and human life. Each unit of e-waste may create every types of hazardous situation especially the health related. Electronics and electrical equipments contain toxic substances and their disposal and recycling become a question of health nightmare. Though the problem varies region to region but urban areas suffers more than the rural areas.

Defining E-waste

Electronic waste or e-waste refers to all forms of electronics and electrical equipments and it's different small and big parts that have been redundant by it's owner as waste without the intent of re-use[1]. E-waste encompasses various forms of electrical and electronic equipments that may be old, might have reached the end of life and most importantly cease to be of any value to the present owner. E-waste is also synonymously called WEEE, the short form of Waste Electrical and Electronic Equipment and has been identified as one of the fastest growing waste streams in the world. E-waste may or may not create visible mountains like municipal waste but definitely a very complex, non biodegradable and toxic form of modern waste. With scientific and technological advancements total quantity of e-waste and at the same time problems generated by e-waste has been increasing day by day.

Types of E-waste:

Electronics and electrical goods are broadly

classified into major heads- 'White goods' comprise of household appliances like refrigerator, washing machine, dishwashers, air conditioner etc., 'Brown goods' that include television, cameras etc. and 'Grey goods' include computers, scanners, printer, mobile phones etc[2]. Including all the above mentioned categories, total E-waste emphatically covers the following important tools and equipments-

- **Temperature Exchange Equipments:** It include different types of cooling and freezing items like refrigerators, freezers, air conditions, heat pumps etc.

- **Screens and Monitors:** It include different types of televisions, monitors, laptops, notebooks and tablets.

- **Large Equipments:** It includes washing machines, dryers, dish washing machines, electric stoves, large printing machines, copying equipments etc.

- **Small Equipments:** It includes vacuum cleaners, microwaves, ventilations, toasters, electric kettles, radio, calculators, video camera, electric toys, small medical devices, etc.

- **IT and Telecommunication Equipments:** It includes all types of mobile phones, GPS, routers, telephones and personal computers.

- **Different Lamps:** It include high intensity discharge lamps, LED lamps, fluorescent lamps etc.

All the above mentioned electric and electronic items or equipments have different life period and respective economic values. After the end of lifetime owners generally throw out the equipments and respectively add to total quantity of E-waste.

E-waste Statistics:

Global quantity of E-waste generation in 2016 was around 44.7 Mt. or 6.1 KG per inhabitant. The global quantity of e-waste in 2016 is mainly comprised of small equipment (16.8 Mt.), large equipment (9.1 Mt.), temperature exchange equipment (7.6 Mt.), and screens (6.6 Mt.) respectively. Lamps and small IT represent a smaller share of the global quantity of e-waste generated in 2016, 0.7 Mt. and 3.9 Mt. respectively. According to one estimate, about 20 to 50 million tonnes of E-waste are being generated annually worldwide. Significantly, most of the E-waste in 2016 was generated in Asian continent which is around 18.2 Mt. or 4.2 KG per inhabitant. In Asia, China generates the highest e-waste quantity both in Asia and the world (7.2 Mt.). Japan generated 2.1 Mt, and India 2 Mt. The top four Asian economies that have the highest e-waste generation in relative quantities are- Cyprus (19.1 KG per inhabitant), Hong Kong, China (19 KG per inhabitant), Brunei and Singapore (around 18 KG per inhabitant) (Balde, CP et al, 2017). Amount of E-waste is expected to grow to 52.2 Mt. in 2021 with an annual growth rate of 3% to 4%.

Quantity of current (2016) E-waste generation for a few countries of the world is given in the following table. As it is shown in the table, quantity of E-waste generation ranges between 0.8 to 28.5 KG per inhabitant.

Table: Country wise domestic E-waste generated in 2016

Sl. No.	Country	E-waste generated (in KG per inhabitant)
1	Australia	23.6
2	Bangladesh	0.9
3	Bhutan	2.5
4	China	5.2
5	France	21.3
6	Germany	22.8
7	India	1.5
8	Italy	18.9
9	Japan	16.9
10	Malaysia	8.8
11	Myanmar	1.0
12	Nepal	0.8
13	Norway	28.5
14	Pakistan	1.6
15	Singapore	17.9
16	Sri Lanka	4.5
17	Thailand	7.4
18	USA	19.4
19	Vietnam	1.5

Source: The Global E-waste Monitor, 2017, Balde, C.P. et.al.

If we see the level of E-waste generated in developed and developing countries of the world then the difference is quite large. The richest country in the world in 2016 generated an average of 19.6 KG per inhabitant whereas the poorest generated only 0.6 KG per inhabitant.

In India, total 65 cities generated more than 60 percent of the total E-waste in the country. Among the top ten cities that generate E-waste in India, Mumbai ranks first, followed by Delhi, Bangalore, Chennai, Kolkata, Ahmadabad, Hyderabad, Pune, Surat and Nagpur respectively. Department of IT wants to provide internet connectivity in all villages in India and wants to increase the internet penetration to 90 subscribers per 1000 people by 2019. Further, the replacement rate of PCs in new age service sectors like BPOs, IT advertising etc. are on the rise. India by 2020, targeted to achieve a PC penetration of 80 per 1000 from the existing 14 per 1000 people. At present India have approximately 15 million computers, target being 85 million computers by 2020. Unfortunately, if all these goals are attained that will directly lead to manifold increase in E-waste in India (*https://rajyasabha.nic.in...E-Waste in India; 2011).*

E-waste Health Hazards

E-waste now makes up around 05 percent of all municipals' solid wastes worldwide, more or less the same amount as general plastic waste, but much more hazardous. With the fast and rapid technological change and lesser lifespan of all electric and electronic products, the problem of E-waste seems to be further compounded in future days to come. E-waste has different potential environment and health impacts if not recycled or cycled inappropriately.

Electronic products are the multifaceted mixture of several hundreds of tiny components. Most of the components in electronic devices contain Lead, Mercury, PVCs, Brominated Flame Retardants (BFRs), Chromium, Beryllium and, Phthalates. Many of these tiny components and substances contain deadly chemicals. These chemicals are the sprain on human health and the environment. Long term exposure to these substances can damage the nervous system, kidney and bones, and the reproductive and endocrine systems of human health. Some of the problems are even Carcinogenic. Heavy amounts of BFRs are used to manufacture several millions of mobile phones in the world. BFRs have been linked to neurotoxicity[3].

Besides, wastes from medical operations are directly dumped on nearby soil and water bodies. These activities are carried out without wearing any protective measures like masks, gloves etc. In many urban regions people are using cable wastes as fuel to cook food. In fact, people are being exposed to toxins 24 hours a day as they live, cook and sleep in the same place where waste is being recycled. Thus, in absence of suitable process and protective measures, recycling E-waste results toxic emissions to the air, water, soil and poses a serious environmental and health hazard.

Some of the available academic literature also explained the same serious types of issues developed from e-waste. As it is explained by Yu, Welford and Hills (2006), overall human health risks from e-waste include breathing difficulties, respiratory irritation, coughing, choking, pneumonitis, tremors, neuropsychiatric problems, convulsions, coma and even death. According to Raghupathy, K., Chaturvedi, Arora, Henzler (2010), e-waste workers are also exposed to other hazards leading to physical injuries and chronic ailments such as asthma, skin diseases, eye irritations and stomach disease. Similarly Yang, Jin, Xu & Lu (2011) explained that particulate matter collected from e-waste recycling areas can lead to inflammatory response, oxidative stress and DNA damage. Thus the health related hazardous issues of e-waste are serious to discuss in every works of human life. It is urgently needed to tackle the problem generated from the waste electronics and electric tools and equipments.

E-waste Recycle:

Currently, out of total e-waste recycled in the country mere 05 percent is recycled by the handful of formal recyclers and the rest is recycled by the informal recyclers. The E-waste recycled by the formal recyclers is done following environmentally sound practices which ensure that the damage to environment is minimized. Formal recyclers also adopt processes so that the work force is not exposed to toxic and hazardous substances released while recycling the waste. Most of the processes used by the informal recyclers are manual, using simple tools like hammer, screw driver, scissor etc. and by the use of rudimentary techniques like burning of wires in

open and using acid baths for the extraction of precious metals.

The situation in India is alarming because of adoption of unethical practices. India has also become the dumping ground of all kinds of waste from the developed countries. E-waste finds it's way into India in the name of second hand use or scrap metals. E-waste is being recycled in all most all the metros in India. Problem of E-waste recycling gets further complicated due to the adoption of unethical practices by corporate and IT companies. According to one estimate, only a few quantity of available e-waste in India is being recycled through the authorized recycling facility. This shows that some corporate are selling the waste to informal recyclers to make some quick money without realizing that they are putting people and the environment at great risk.

Conclusion

Handling of E-waste is dangerous due to chemicals present in the products and the way to tackle the problem is to design clean products that free from chemicals with longer life span. They should be easy and safe to recycle and not expose workers and the environment to hazardous chemicals. Manufacturers of electronic products must stop using hazardous chemicals and substitute them with safer alternatives.

Unfortunately, the trend of going green and clean manufacturing products free from chemicals is slowly catching up in the world as well as the country India. In April 2008, Ministry of Environment and Forest, Government of India has issued 'Guide lines for environmentally sound management of E-waste'. It focuses on the need to facilitate the recovery or reuse of useful electric materials. It incorporates reduction of e-waste quantity in every walk of life. If appropriately implemented, government initiative will reduce the wastes destined for final disposal and subsequently ensure environmentally sound management of all materials in India.

Declaration

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A Survey of Oral Medicine Curriculum and Practice in India

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Abstract

Background: Oral Medicine specialists provide clinical care to patients with a wide variety of chronic diseases affecting the oral and maxillofacial region, oral manifestations of systemic diseases and behavioral disorders and provide general dental care to patients with medically compromised states. It is important to conduct studies that address the strengths and shortcomings of our specialty and the current system of its education and practice in order to yield highly skilled professionals and truly serve the oral health care needs of the public.

Aim & Method: This study aims to describe the current status of Oral Medicine curriculum and practice in India. A survey was designed to assess the current status of oral medicine education and clinical practice. The survey was sent to Oral Medicine Specialists across India to assess their opinion and analyze the benefits and shortcomings of the present system.

Results: 52 respondents completed the survey from various states across India. More than 87% of respondents considered management of oral mucosal diseases, salivary dysfunction, oral manifestations of dermatological diseases, HIV, oral manifestations of systemic disease and facial pain as part of Oral Medicine. Only 27% of respondents reported participating in multidisciplinary clinics for treatment of patients, and 85% of respondents agreed to the need for presence of multidisciplinary clinics. 85% of respondents agreed to the suggestion of developing a curriculum for training in Special Care Dentistry for Oral Medicine postgraduates in India.

Conclusion: Limitations to this survey study include a small sample size. Future efforts at defining the scope of oral medicine practice in India and improvements in training and education can help model future graduates and inspire undergraduates to choose Oral Medicine as a career.

Keywords: *Oral Medicine, Survey, Clinical Practice, Oral Medicine curriculum*

Introduction

Oral Medicine is a specialty largely credited to Dr.Lester Burket, considered as the Father of Oral Medicine [1]. It has been a recognized specialty in many but not all countries and has been a way to integrate Medicine and Dentistry, via oral health and its effects on systemic health and vice versa. The American Academy of Oral Medicine defines it as the discipline of dentistry concerned with the oral health care of medically compromised patients and the diagnosis and nonsurgical treatment/management of medically related disorders or conditions affecting the oral and maxillofacial region [2].

Oral Medicine experts typically provide non-surgical treatment to various oral mucosal diseases, soft and hard tissue lesions, salivary gland disorders, viral, bacterial and fungal infections of the oral cavity, temporomandibular joint disorders, orofacial pain syndromes, chemosensory disorders, oral complications of cancer chemo/radiotherapy and also care for patients with oral manifestations of systemic illnesses[1]. Oral Medicine as a specialty is driven by the type of training

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offered, and the scope of clinical practice. Very few articles have been published that have investigated the standard of training in postgraduates and the scope of clinical practice globally [3, 4]. In two global survey studies, results have been quite parallel, most of the respondents recognizing postgraduate Oral Medicine training as a distinct field, and that the scope of practice and training competence in diagnosing and managing oral conditions that have been previously listed [3, 4]. Stoopler et al have reported that India had the largest number of oral medicine specialists compared to other countries, maybe because the Oral Medicine specialist initially screens patients in dental hospitals [4]. The objectives of this survey is to describe the status of Oral Medicine training and clinical practice among experts in India, to discuss the benefits of the current system, to address any possible shortcomings and to make recommendations to remodel future training and practice.

Materials and Method

The survey was designed using existing information from previous studies, with a closed response pattern. Standardized emails linked to online survey questionnaires (using Google Forms) were used. The email invitation to participate in the survey was sent to Oral Medicine specialists across India. A total of 52 respondents fully completed the survey. Data obtained were analyzed using simple descriptive statistics.

Results

The average age of Oral Medicine practitioners in India among the respondents was 33.8 years, with an average experience of 7.8 years. The distribution of respondents based on location has been illustrated in Figure 1. The average number of colleagues practicing with the respondents in a hospital setting was 7.6. Respondents reported a mean of working 27 h per week including clinical practice, teaching and administrative duties with a maximum of 40 hours per week

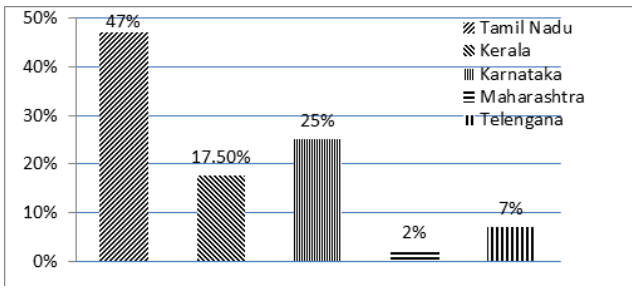

Figure 1 Percentage of respondents by state.

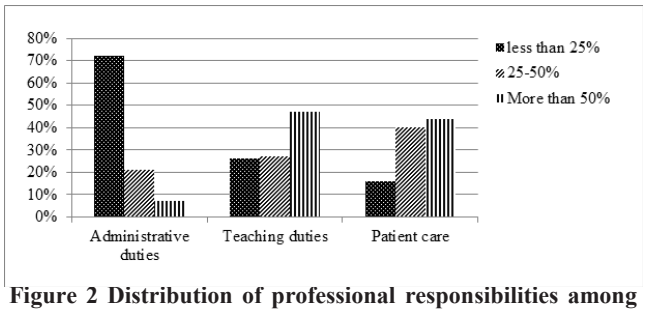

Figure 2 Distribution of professional responsibilities among practitioners

Less than 25% of the time was spent on research among practitioners.

94.3% of participants had a formal training for three years followed by an examination for certification. 24% of participants hold a PhD. 5.7% of participants had a fellowship or equivalent by a board examination and certification. Majority of respondents reported that no funding was obtained and training was predominantly self-funded.

Most commonly, practitioners reported to be a part of Oral Medicine department in Hospital/ Dental College settings with maximum time spent on teaching duties. The most common settings for Oral Medicine practice were dental hospitals and dental schools, followed by private practice. Practice in medical schools was the least common.

When asked about the definition of Oral Medicine, more than 87% respondents considered management of oral mucosal diseases, salivary dysfunction, oral manifestations of dermatological diseases, HIV, oral manifestations of systemic disease and facial pain as part of their duties. Fewer respondents considered management of patients with physical and mental disabilities and general dentistry for medically complex patients in the definition of Oral Medicine. Oral medicine plays an important role in detection, treatment and monitoring of oral potentially malignant disorders, oral manifestations of systemic diseases and oral treatment of medically compromised states. The latter two are important as they are the link between medicine and dentistry that can be a useful service for both the patient and the medical practitioner. Oral manifestations can sometimes be the starting point of diagnosis of a systemic illness or may be a sign of progression of the disease state which highlights the importance of collaboration between doctors and oral medicine practitioners [5].

A prospective survey conducted by the Diplomates of the American Board of Oral Medicine showed an

increase in patients with medically compromising states, with more than 80% of cases requiring a comprehensive evaluation of the medical condition and dental treatment for patients with severe systemic disease. Majority of referrals were from general dentists and medical practitioners [6]. This highlights the changing scenario in oral medicine treatment needs among the public. A survey conducted among medical practitioners in Chennai about the awareness of Oral Medicine as a specialty in dentistry. Only 71% of respondents were aware of the specialty of Oral Medicine and the scope of the specialty. 29% were not aware of it and many oral manifestations and orofacial disorders were not always referred to the right dental practitioner [7]. The aging population will lead to an increase in oral complications in medically compromised patients and practitioners will spend most of the times caring for the elderly and severely ill patients. So, the integration of medicine and dentistry becomes even more important and training oral medicine graduates in managing oral health needs of medically compromised, physically challenged and behaviorally compromised patients is imperative [8]. Figure 3 shows the types of oral and maxillofacial diseases that constitute the definition of oral medicine according to the survey respondents.

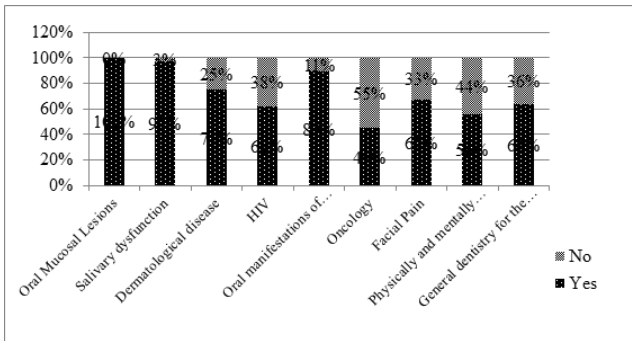

Figure 3 Definition of Oral Medicine

95% of survey respondents agreed that there is a need for better communication and integration between dental and medical practitioners. Collaboration between the dental and medical profession can highly benefit the patient, especially, patients undergoing cancer therapy, patients in intensive care units and patients in long term care facilities where dental care can be provided by a trained professional rather than non-dental personnel as poor oral health can contribute to increased morbidity and decreases quality of life [9]. This reinforces the need for educating the oral medicine graduates to serve as a partner to physicians thereby enhancing the level of care provided to patients [9].

Only 27% of respondents reported participating in multidisciplinary clinics for treatment of patients, and 85% of respondents agreed to the need for presence of multidisciplinary clinics. The use of multidisciplinary clinics is especially important when treating oncology patients, patients with severe systemic illnesses.

24% of respondents reported less than 25% of patients are seen on follow up, 45% of respondents had more than 50% of patients with follow up visits.

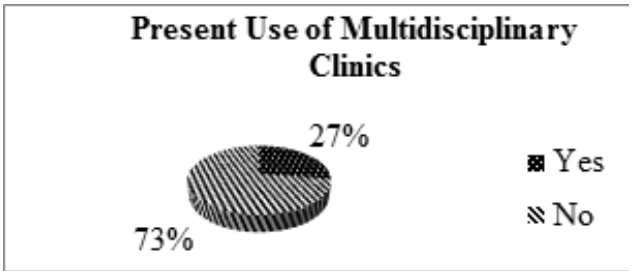

Figure 4 Use of Multidisciplinary clinics

Figure 5 represents the types of oral and maxillofacial diseases and conditions seen in oral medicine practices in India as reported by the respondents. Previous studies from other countries have reported the scope of practice, sources of referral, lesion occurrence and types of patients reporting to Oral Medicine Practices [10, 11]. Reports such as these are required to be done periodically and methodically to better understand the scope of oral medicine practice in India and to improve the curricula of postgraduate students for them to be better equipped with knowledge and skills needed to handle patients [10].

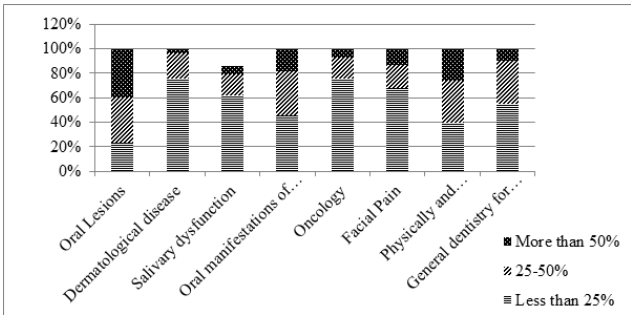

Figure 5 Percentage of patients with different orofacial diseases.

85% of respondents agreed to the suggestion of developing a curriculum for training in Special Care Dentistry for Oral Medicine postgraduates in India. Various studies have reported the medical problems in these patients and the rate of occurrence demonstrates the importance of general medicine knowledge and training in handling such patients [12-14]. Inclusion of Special Care Dentistry in the Oral Medicine curriculum does pose challenges in obtaining national consensus. Studies to identify types of patients, services available

and core skills required to qualify dentists are required for the introduction of Special Care Dentistry in the curriculum [15].

90% of respondents were open to the introduction of the internet and Smartphone applications in communication among clinicians and between patients and clinicians. Although studies have confirmed safety and benefits of Smartphone use in healthcare, adequate training and awareness of possibilities and limitations is imperative. This can be an adjunct in doctor-doctor and doctor-patient communication and help in referral and documentation [16, 17].

Discussion

This preliminary study was an attempt to investigate the current status Oral Medicine education and clinical practice across India. Our objective was to assess the practitioner and practice characteristics, investigate the types of patients treated, and the opinion of oral medicine specialists in on recommending changes and improvement in training and curriculum. Our findings suggest that oral medicine specialists in India treat a wide variety of patients including oral mucosal lesions, mucocutaneous diseases, salivary gland disorders, temporomandibular joint disorders, and oral manifestations of systemic diseases. Fewer respondents reported participation in multidisciplinary clinics, the presence of a Special Care Dentistry curriculum in the Oral Medicine postgraduate training. But almost all respondents considered provision of dental care for medically compromised patients, physically and mentally disabled patients to be a part of Oral Medicine Practice [4]. The diversity in practice characteristics can be attributed to regional variations in opinions among specialists, different systems of training and clinical practice.

There is increasing evidence that oral health has a significant effect on overall systemic health and that there are inadequacies in the interrelationships between dental and non-dental health care providers. It is time for dental education to establish integration of dental and medical training and practice in order to increase oral health knowledge among medical professionals and to increase the knowledge of oral-systemic health interface and a working knowledge of General Medicine among dental professionals. Oral Medicine Specialists may be considered the best choice for this integration because of its close connection with general health and systemic disease [18, 19]. Oral Medicine graduates should be competent enough to understand the interactions between, oral health, nutrition, general health, drug interactions, oral effects of systemic diseases, and also be familiar with provision of dental care to severely ill and physically/mentally challenged patients in a hospital setup. Training in Special Care Dentistry can provide the specialists the ability to handle challenges associated with treating physically/medically/mentally compromised patients including the management of medical emergencies, management of anxiety, management of frail/elderly patients, patients with severe systemic disease, patients in long term care facilities, treatment under general anaesthesia and sedation, and provision of dental treatment in different setups like hospitals, intensive care units, nursing homes, special schools and general practice [15, 20].

Older trends of procedure driven/mechanical dentistry are gradually being replaced by a more preventive/regenerative approach. Oral medicine is the best choice to handle the noninvasive and preventive aspects of future oral healthcare and for the integration into the medical field [21, 22]. Future studies are recommended to obtain a more detailed report of the status of oral medicine in India. Efforts at defining the scope of oral medicine practice in India and improvements in training and education can help modeling future graduates and inspire more students to choose oral medicine as a career.

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A Retrospective Study on Side of Nerve Involvement and Distribution of Pain in Patients with Trigeminal Neuralgia

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Abstract

BACKGROUND: Trigeminal neuralgia is chronic, debilitating and painful condition involving the trigeminal nerve and has a major impact on patients' quality of life. It is characterized by brief attacks of excruciating pain in the area of distribution of one or more branches of the trigeminal nerve. It has an annual incidence of about 4.5 to 12.6 per 100,000 population and has a female predilection. According to studies, it commonly occurs in the older age group and a hallmark of idiopathic trigeminal neuralgia is that it occurs twice as often on the right side of the face. There are various hypotheses proposed to explain this side predilection.

AIM: To evaluate and analyze the side of occurrence, distribution of pain in patients diagnosed with trigeminal neuralgia among patients visiting Saveetha Dental College.

MATERIALS AND METHOD: The retrospective clinical data of 42 patients who reported with a complaint of orofacial pain and diagnosed with trigeminal neuralgia in the department of Oral Medicine and Radiology, Saveetha Dental College from Jan 2016 to Dec 2017 were obtained. The data regarding age of onset, gender, side of nerve involvement, and distribution of pain was retrieved and analyzed.

RESULTS: Trigeminal neuralgia was mostly diagnosed in the 5th and 6thdecades of life with a mean age of 55.3 years. Male patients were affected more than female patients but the difference was not comparable. It affected the right side more frequently and the maxillary branch was the most commonly involved.

CONCLUSION: This study investigated the clinical characteristics of 42 patients diagnosed with trigeminal neuralgia. Further multicentre studies need to be done to investigate the clinical characteristics and imaging studies need to be done along with anatomical studies to investigate causes for nerve entrapment as an etiological agent for trigeminal neuralgia.

Keywords: *Trigeminal neuralgia, site predilection, trigeminal nerve, orofacial pain, neuropathic pain*

Introduction

The trigeminal nerve is the principal nerve that provides general sensory supply to the face, scalp and mouth. First described by Galen in 200 A.D as 2 pairs of separate nerves due to its large peripheral branches, Fallopius (1500's) later said that the three branches merged as one within the cranial cavity. The name "trigeminal nerve" meaning "three twins" was derived from the name "nerf trijumeau" given by a Danish anatomist Jacques-Benigne Winslow [1]. The mesencephalic nucleus, main sensory nucleus, spinal nucleus and the motor nucleus give rise to sensory and motor fibres. The nerve from the pons has a relay in the Meckel's cave wherein the Gasserian ganglion lies. Three divisions of the trigeminal nerve arise from the gasserian ganglion and exit the cranial cavity through the superior orbital fissure, foramen Rotundum and Ovale. The 3 divisions are the ophthalmic (V1) and Maxillary (V2) and the Mandibular division (V3). The nerve may be involved in a number of pathologies. A thorough understanding of its anatomy is of vital importance in

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diagnosis and treatment of disease [2].

Trigeminal neuralgia (TN) is a rare condition causing excruciating, intermittent, short lasting, usually unilateral facial pain, also called as tic doloreux meaning "painful spasm". The prevalence tends to be higher in females than in males and most commonly reported above the age of 40 with a peak at 50-60 years. The right side has been reported to occur more frequently than the left [3, 4]. Sharp, stabbing or shooting, electric shock-like pain occurs in the area of distribution of one or more branches of the nerve. Pain is provoked by light touch to areas of the face termed as trigger zones. Trigger factors include washing the face, brushing teeth, shaving, and others [5].TN can be classified as Classical TN (idiopathic or primary TN) and Symptomatic TN (secondary TN). Patients with multiple sclerosis are also susceptible and frequently have bilateral facial pain [6]. While classical TN occurs without an apparent cause, symptomatic TN can usually be attributed to a recognizable disorder or pathology in intrinsic or extrinsic locations such as trauma, infections such as herpes zoster, multiple sclerosis, space occupying lesions including cysts and tumours[7, 8].

Several mechanisms attempt to explain the pathogenesis of classical TN. The leading theory is the demyelination of sensory nerve fibres due to compression by blood vessels at the nerve root. The offending vessel is the superior cerebellar artery or the anterior inferior cerebellar artery. Histological studies have revealed focal demyelination in the vicinity of the vascular compression. The demyelinated axons allow spontaneous generation of ectopic nerve impulses and ephaptic transmission to adjacent fibres[9]. The "Ignition hypothesis" (Devor et al) is the most accepted hypothesis stating that TN arises from abnormalities of the afferent neurons in the root or ganglion. Injury from neurovascular conflict causes axons hyperexcitability, resulting in paroxysmal painful sensory discharge. Neighbouring neurons are recruited, leading to a rapid buildup of electrical activity (ephaptic cross talk) and pain amplification as the demyelinated neurons lie in close contact. Devor described the stop mechanism as due to post-discharge hyperpolarisation which makes the nerve refractory to further excitation. This is seen as asymptomatic periods between attacks of pain [10]. The disease is characterized by recurrences and remissions with 50% of patients reporting periods of spontaneous remission lasting weeks, months or years [11]. Patients with new onset TN typically undergo an MRI to rule out recognizable causes and to visualize possible compressing vessels on the nerve root [9].

One clinical hallmark of classical TN is that the right side is more commonly affected than the left but there are no reasons for the blood vessels causing vascular compression to be more tortuous in the right side. One hypothesis which said that higher incidence on the right side is caused by improper brushing on this side by right handed people leading to a higher incidence of caries was discarded because the frequency of left sided TN in left handed people is not different from right handed individuals [12]. Anatomical and radiological studies have reported that foramina rotundum and ovale are asymmetrical and that the left side is wider and larger than the right [13] [14]. Vascular compression produces demyelination, an inflammatory reaction and an increase in perivascular lymphocytes, lipid laden macrophages and collagen content of the neuronal extracellular matrix distal to the site of compression [15] [16]. Neto et al [17] say that these changes can cause entrapment of the nerve on the right side more commonly than the left because of the difference in size of the foramina which could explain the higher incidence of TN on the right side. For example, cases of TN related to multiple sclerosis is also more common in the right side, and in bilateral neuralgia, the right side had more severe symptoms than the left [18]. No differences in size of foramina have been established in women and men [17]. Although earlier reports show a strong female predilection, recent reports suggest that only 60 % of the TN patients are female. No known racial or ethnic risk been reported [19]. The objective of this study is to investigate the clinical characteristics of patients diagnosed with TN.

Materials and Method

This descriptive study was carried out in the department of Oral Medicine and Radiology. Clinical data was retrieved retrospectively from the electronic clinical record database of patients diagnosed with TN from January 2016 to December 2017. 42 patients who were diagnosed with TN based on clinical features and response to treatment with carbamazapine were included. All patients were examined using orthopantomography to rule out any pathology or other odontogenic causes. Clinical data regarding age, gender, side and distribution of pain over areas supplied by the trigeminal nerve were collected and analyzed for applying descriptive statistics.

Results

The age of patients varied from 31 to 85 years with

a mean age of 55.3 years at presentation. Table 1 shows the distribution of patients based on age of onset.

Table 1 Age distribution among patients

Age in years	Male (n=23)	Female (n=19)	Total (n=42)	Percentage (%)
31-40	1	3	4	9.5%
41-50	4	3	7	16.6%
51-60	5	8	13	30.9%
61-70	12	4	16	38%
71-80	0	1	1	2.3%
>80	1	0	1	2.3%

Out of 42, 23 (54.7%) patients were male and 19 (45.2%) were female. Most of male patients were in their 6th decade of life and most of the female patients were in their 5th decade of life. Most common age group for occurrence of TN was 51-60 years (30.9%). Table 2 shows the side involved in male and female patients. 61.9% of patients had right sided TN and 33.3% had left sided neuralgia. The difference in side involved is more apparent in female patients – 14 (73.6%) patients had right sided neuralgia and only 3 (15.7%) patients had left sided neuralgia. No cases of bilateral TN were found.

Table 2 Side of involvement among male and female patients

Side of Involvement	Male (n=23)	Female (n=19)	Total (n=42)	Percentage (%)
Right	12	14	26	61.9%
Left	11	3	14	33.3%

Table 3 shows the involvement of various divisions of the trigeminal nerve in the sample. The right maxillary division was the most commonly involved nerve seen in 26.1% of patients. This was followed by equal involvement of left maxillary and right mandibular division of the trigeminal nerve seen in 19% of cases each. A combination of right maxillary and right mandibular division of the trigeminal nerve was involved in 11.9% of patients. The involvement of the ophthalmic division was the least common. Only 1 patient was diagnosed with TN of the left ophthalmic division. 1 patient had involvement of right ophthalmic and maxillary nerves. In female patients, the most common area involved is the area distributed by the right mandibular division and in male patients, the most commonly involved nerve was the right maxillary nerve.

Table 3 Pain distribution among divisions of trigeminal nerve

Division of Trigeminal nerve involved	Male (n=23)	Female (n=19)	Total (n=42)	Percentage (%)
Right ophthalmic (V1)	0	0	0	0
Left ophthalmic (V1)	1	0	1	2.3%
Right maxillary (V2)	7	4	11	26.1%
Left maxillary (V2)	5	3	8	19%
Right mandibular (V3)	3	5	8	19%
Left mandibular (V3)	3	1	4	9.5%
Combinations				
Right maxillary and mandibular (V2,V3)	1	4	5	11.9%
Left maxillary and mandibular (V2,V3)	2	2	4	9.5%
Right ophthalmic and maxillary (V1,V2)	1	0	1	2.3%
Total	23	19	42	100%

Discussion

Neuralgic pain imposes substantial amount of burden to affected patients. Patients experience excruciating pain that lasts seconds to minutes followed by a painless refractory period in between attacks. Even during the refractory period, patients are overwhelmed with fear that the pain could occur at any instant. This causes significant impairment in function and daily life [20]. Clinical criteria for diagnosis based on pain characteristics are given by the International Headache Society. Neurological examinations, MRI scanning, Sensory testing, electrophysiological studies may be used as specific investigations to rule out organic causes for symptomatic TN [8]. Early epidemiological studies have reported the right trigeminal nerve to be more involved than the left. There is very little research to explain this phenomenon. Neto et al have stated the following reasons to support their hypothesis that nerve entrapment following vascular compression of nerve root is responsible for more incidence of right sided TN [17]. The difference in size of foramen ovale and rotundum is one reason. But, while the difference in size of foramen ovale is found in 75% of cases, difference in size of foramen rotundum is seen only in 8% of cases [13, 14]. Another finding that supports this hypothesis is related to Bell's palsy. In Bell's palsy, the facial nerve also shows oedema and both right and left sides are involved with equal frequency. This could because there is very little asymmetry in the stylomastoid foramen and internal acoustic meatus for the right and left side [13, 21]. In other syndromes involving the cranial nerves such as glossopharyngeal neuralgia, hemifacial spasm, the right and left sides are equally affected and the foramina of these nerves are only slightly asymmetrical [13, 22]. Even TN occurring due to cysts and tumours in the posterior cranial fossa occur predominantly on the right side even though the cysts and tumours showed no side predilection [17].

As substantial recurrence rates are reported after decompression surgery, involvement of other factors is more likely. Nerve entrapment in the foramina may be one such factor. So, more studies are required to test this hypothesis as it may improve treatment and patient selection for surgery. In this investigation, as reported in previous studies [23-26], right side was more commonly involved than the left side. But, in contrast, male patients were affected more than female patients. This may be attributed to the small sample size. Anatomical studies could also reveal an asymmetry in foramina in the right and left side in different populations. Imaging and anatomical studies should be done to detect and quantify any such discrepancies which could explain the side and gender predilection in the Indian population.

Conclusion

This study investigated the clinical characteristics of 42 patients diagnosed with TN. It was more common in the right side and more common in male patients. The major limitation to the present study is the small sample size which could have caused discrepancies in the results compared to previous studies and the results cannot be generalized to a larger population. Further multicentre studies need to be done to investigate the clinical characteristics and imaging studies need to be done along with anatomical studies to investigate causes for nerve entrapment as an etiological agent for TN.

Conflict of Interests: The authors declare no conflict of interests.

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Ethical Clearance: Not Required

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A Comparative Analysis of Self-Efficacy in Low Fidelity Vs High Fidelity Simulation Post Advanced Cardiac Life Support (ACLS) Sessions on Cardiac Arrest Algorithm amongst EMS Students of Pune, India

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Abstract

Background: Self-efficacy is a personal characteristic believed to increase an individual's abilities to be successful in a task. Self-efficacy, as defined by Albert Bandura is a "belief" that one possesses the requisite skills to do what is needed to reach a successful outcome."

Cardiac arrest is one of the most common emergencies encountered by EMTs in real clinical world, hence self-efficacy in such a situation is of paramount importance. Self-efficacy is composed of two key components i.e. satisfaction and confidence in one's own abilities.

Objective: The objective of the study is to compare self-efficacy reported by EMS students after

ACLS protocol on cardiac arrest algorithm using High fidelity vs low Fidelity simulation.

Methodology: Hundred PGDEMS students were chosen for the study by convenience sampling. The students were divided into two groups of fifty each after matching for age, sex and previous course grades.

Both groups were taught ACLS protocol on Cardiac Arrest Algorithm by classroom teaching over a four hour session conducted on two days.

The students were provided with a standardized and pretested "Student Satisfaction and Self- Confidence Learning Questionnaire consisting of 13 items (5 items on Satisfaction and 8 items on Self Confidence in learning). Each item was rated on a 5 point Likert Scale.

Discussion: The students in HFS group found the High Fidelity methodology to be more helpful and effective. Also the students reported greater enjoyment during the simulation activity on the High Fidelity manikin.

In terms of confidence, the HFS group reported statistically significant higher scores in 6 out of the 8 items on the questionnaire.

Conclusion: The findings of the study favor the use of High Fidelity Simulation (HFS) as the preferred methodology to teach cardiac arrest algorithm to EMS students.

Keywords: *High Fidelity Simulation (HFS), Low Fidelity Simulation (LFS), Emergency Medical Services (EMS)*

Background

Self-efficacy is a personal characteristic believed to increase an individual's abilities to be successful in a task. Self-efficacy, as defined by Albert Bandura is a "belief" that one possesses the requisite skills to do what is needed to reach a successful outcome."[1]

Self-efficacy is a very important trait required in Emergency medicine as Emergency Medical Technician

(EMT) has to respond to complex unpredictable situations in an extremely short period of time.[2]

The Post Graduate Diploma in Emergency Medical Services (PGDEMS) trains medical professionals in the basics of Emergency Medical Services (EMS).These students are taught life saving skills which help them provide medical aid even before the patient reaches the hospital. Currently EMS students are taught with the help of part-task trainers, a form of Low Fidelity Simulation (LFS) wherein students engage in problem based learning with the help of case studies. In recent years High Fidelity Simulation (HFS) using hi-tech manikins and dynamic clinical scenarios are being utilized to teach EMS students.[3]

A study by Massoth et.al[4] (2019) concluded that simulation based training has evolved into an indispensable tool in medical education. Simulation can nurture self-efficacy with the necessary motivation to create behavioral shifts that might positively influence the individual, team and patients. A study conducted by Hoadley Theresa et.al[5] (2009) showed a positive correlation between enhanced practice and learning using HFS but no significant correlation was found between the posttest and skills test scores obtained in the students of the two groups.

Another study conducted by Stellflug SM et.al6 (2017) concluded that HFS in critical emergencies increases Health Care Providers (HCPs') ability to recall valuable knowledge that can positively impact patient's outcomes.

A study by Cynthia A Blum et.al7 (2010) indicated an overall improvement in self-confidence and competence among nursing students trained on simulation. Another study by Morfoot et.al8 (2018) concluded that self-efficacy, or the belief in one's ability to succeed, is a commonly cited outcome of simulation training and can influence confidence, achievement and performance.

Cardiac arrest is one of the most common emergencies encountered by EMTs in real clinical world, hence self-efficacy in such a situation is of paramount importance. Self-efficacy is composed of two key components i.e satisfaction and confidence in one's own abilities.9

Objective

The objective of the study is to compare self-efficacy reported by EMS students after ACLS protocol on cardiac arrest algorithm using High fidelity vs low Fidelity simulation.

Methodology

Hundred PGDEMS students were chosen for the study by convenience sampling. The students were divided into two groups of fifty each (Low Fidelity simulation group and High Fidelity Simulation group) after matching for age, sex and previous course grades.

Both groups were taught ACLS protocol on Cardiac Arrest Algorithm by classroom teaching over a four hour session conducted on two days.

On the day of simulation session, students of both groups were further divided into batches of ten each. The Low Fidelity Simulation group was given a case scenario of Cardiac arrest on a part task trainer (LFS) while the High Fidelity Simulation group was given a simulated case scenario of cardiac arrest designed on High Fidelity Manikin. Each simulation session lasted for fifteen minutes.

The students then underwent a focused debriefing of five minutes after each simulation session. On completion of debriefing, the students were provided with a standardized and pretested "Student Satisfaction and Self- Confidence Learning Questionnaire consisting of 13 items (5 items on Satisfaction and 8 items on Self Confidence in learning). Each item was rated on a 5 point Likert Scale. The questionnaire's Cronbach's alpha for Satisfaction is 0.94 and for self- confidence is 0.87

The data collected was tabulated and analyzed for significance in difference of means using two-tailed t - test on Statistical Package for Social Sciences (SPSS) v23.

Results

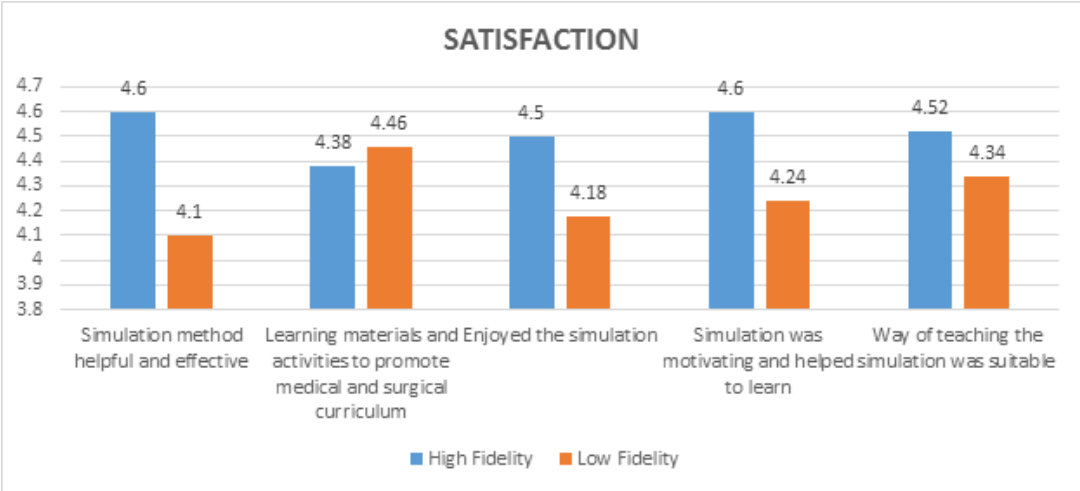

Figure 1.

The above Figure 1. depicts the comparative total mean scores obtained on the 5 items of satisfaction questionnaire by the two groups of students with High Fidelity vs low Fidelity simulation. The High Fidelity group gave higher satisfaction scores on all items except the one pertaining to the variety of learning materials and activities used during simulation.

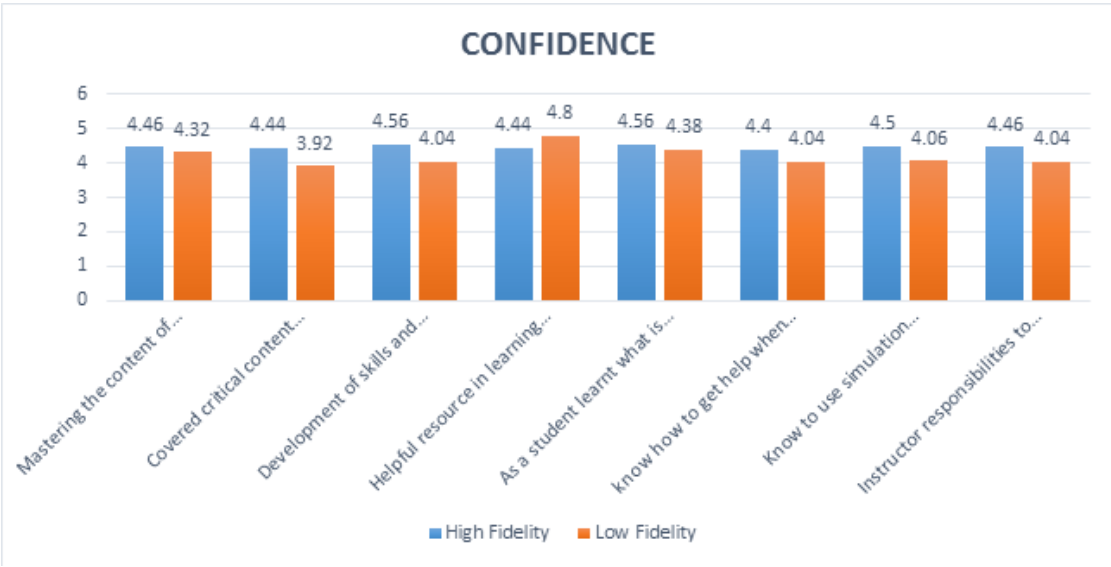

Figure 2.

The above Figure 2. depicts the comparative mean score obtained in the 8 items of self -confidence questionnaire by the two groups of students. The High Fidelity Simulation (HFS) group exuded greater confidence in all parameters except the one pertaining to the resourcefulness of the techniques in learning simulation.

Table No 1: p value for 13 items of Student Satisfaction and Self Confidence in Learning Questionnaire:

Satisfaction	**p Value**
Teaching methods used in simulation helpful and effective	0.00004*
Promote learning the medical and surgical curriculum	0.59
Enjoyed the simulation	0.006*
Teaching materials used in simulation was helpful and effective	0.14
Way the simulation taught was suitable	0.24
Confidence	
Mastering the content of simulation activity	0.00002*
Simulation covered critical content necessary for the mastery of medical and surgical curriculum	0.00002*
Developed skills and obtained required knowledge from simulation to perform necessary task in clinical settings	0.00002*
helpful resource to teach the simulation	0.0001*
Responsibility as a student to learn what is needed to know from simulation activity	0.09
To get help when didn't understand the concepts covered in simulation	0.002*
To use simulation activities to learn critical aspects of these skills	0.0001*
Instructor responsibilities to tell what is needed to learn out of simulation content	0.0008*

*indicates significance

Discussion:

The study aimed to compare the self-efficacy after a cardiac arrest reported by EMS students after a cardia arrest algorithm on Low Fidelity Simulation (LFS) vs High Fidelity Simulation (HFS). In terms of satisfaction, 2 items on the questionnaire showed statistical difference between the two groups.

The students in HFS group found the High Fidelity methodology to be more helpful and effective. Also the students reported greater enjoyment during the simulation activity on the High Fidelity manikin. It is essential that students enjoy a learning activity in order to increase the retention of knowledge and to motivate the students to participate in further learning activities.

In terms of confidence, the HFS group reported statistically significant higher scores in 6 out of the 8 items on the questionnaire. The students agreed that coverage of critical content necessary for mastering the topic of cardiac arrest algorithm was achieved better with high Fidelity technique. The HFS group considered High Fidelity as a better alternative for developing skills and obtaining knowledge on the subject. The students also felt more confident regarding the utility of simulation activities in learning, role of facilitation and instructor's responsibilities in HFS.

Interestingly the LFS group reported greater confidence in attributing simulation as a helpful resource in learning.

This finding indicates greater comfort zone shown by students to LFS as they are routinely exposed to the technique during the course. HFS being a new technique shall need more frequent exposure to be considered as a truly precise and helpful resource.

Conclusion

The findings of the study favor the use of High Fidelity Simulation (HFS) as the preferred methodology to teach cardiac arrest algorithm to EMS students. A single session positively impacted confidence and satisfaction thereby boosting the self-efficacy of EMS students. Repeated sessions of HFS for various emergencies can further augment self-efficacy among students. This can be explored in future research.

Ethical Clearance – IEC, SIU

Source of Funding - Nil

Conflict of Interest - Nil

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Concept Map Prebriefing Versus Traditional Prebriefing in Ischemic Stroke Management amongst EMS Students of Pune, India

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Abstract

Introduction: Worldwide, stroke is the commonest cause of mortality after coronary artery disease. Majority of the stroke cases present in Emergency Department (ED). Therefore, the clinical acumen of medical staff in pre-hospital and ED in assessment of stroke is can significantly reduce the morbidity and mortality. Prebriefing helps to build confidence before exposure to the clinical scenario. This can prove to be very helpful in ischemic stroke assessment.

Objective: To study difference in competency performance amongst EMS students who participate in concept Map Prebriefing versus Traditional Prebriefing in clinical simulation scenario on Ischemic Stroke Management.

Methodology: Seventy-two PGDEMS students were chosen for the study by convenience sampling. The students were divided into two groups, A and B of 36 each after matching for age, sex and previous course grades. On the day of Simulation session, Group A was administered traditional prebriefing while Group B underwent Concept Map Prebriefing on the topic of Ischemic Stroke. The prebriefing concluded with narration of a case of Ischemic stroke. Each group was further subdivided into 6 smaller groups for ease of conducting assessment. A structured debriefing for each subgroup lasting for 20 minutes followed the Simulation session. The competency performance was scored using The LAPSS survey. The score obtained by a group could range from 0 to 8.

Discussion: The students prebriefed by the concept map methodology scored better than their peers on a number of parameters including key points in history taking. The above findings emphasize the role of comprehensive concept map prebriefing in impacting the student performance as measured by the LAPSS survey.

Conclusion: Traditional prebriefing orients the student to simulation environment but is found to be inferior to concept map prebriefing in terms of improving competency performance assessment in ischemic stroke.

Keywords: *rebriefing, Concept Map, Ischemic Stroke, high fidelity Simulation.*

Introduction

The World Health Organization (WHO) defines stroke as "rapidly developing clinical

Signs of focal (at times global) disturbance of cerebral function, lasting more than 24 hours or leading to death with no apparent cause other than of vascular origin"[1]. It is classified into two major types: Ischemic and Hemorrhagic. Ischemic stroke is by far the commonest, accounting for 85% of all strokes while hemorrhagic stroke accounts for the rest.

Worldwide, stroke is the commonest cause of mortality after coronary artery disease. In addition, it is the commonest cause of chronic adult disability. More than four-fifth of all strokes occur in developing countries In contrast to industrialized Western countries where there has been a steady decline in stroke over the

past 30 years. India is currently facing the challenge of a high stroke incidence.[3] 8–12% of patients die within 30 days of their first stroke and those that survive the first attack are at increased risk of a recurrence[4]. Hence, early assessment and management of patient is of paramount importance.

Majority of the stroke cases present in Emergency Department (ED). Therefore, the clinical acumen of medical staff in pre-hospital and ED in assessment of stroke is can significantly reduce the morbidity and mortality. Identifying signs and symptoms of a suspected stroke patient is a challenging task. Usage of standardized tools for assessment can definitively improve the diagnostic accuracy[5].

Los Angeles Prehospital Stroke Screen (LAPSS) is an 8-item survey tool consisting of four items pertaining to history taking, one item pertaining to blood glucose measurement and three items pertaining to examination for detecting unilateral motor weakness. The LAPSS allows prehospital personnel to identify patients with acute cerebral ischemia with a high degree of sensitivity and specificity. The assessment of a suspected stroke patient involves quick and accurate clinical judgement . Prompt assessment can help prehospital personnel to initiate neuroprotective drug administration in the field thereby providing treatment in the narrow therapeutic window[6].

Varying degrees of simulation have been used to teach cases of ischemic cases of ischemic stroke of EMS students. The purpose of simulation is to act as an adjunct to clinical hours, for specialty experiences ,for competency assessment, for crisis resource management or team training, and for inter-professional education[7].

Simulation experiences involve three main dimensions: pre-briefing, unfolding the scenario and debriefing. Prebriefing is the first step in a simulation based education experience.

In simulation, traditional prebriefing activities assist learners by introducing scenario objectives, and typically include communication of the patient presentation, participant roles, tasks, time allotment, and an orientation to equipment and to the general environment.[8] rebriefing helps to build confidence before exposure to the clinical scenario. There are numerous studies, which have evaluated the impact of debriefing in competency assessment, but very few studies have focused on the contribution of prebriefing in building competencies. An emerging alternative view to traditional prebriefing is utilization of concept mapping. Concept Mapping serves to connect the cognitive and reflective processes in a framework that is understandable to the learner. It enables them to use pre-existing knowledge and their assessment of a situation to develop clinical decision-making skills.[9]

This can prove to be very helpful in ischemic stroke assessment.

Objective

To study difference in competency performance amongst EMS students who participate in concept Map Prebriefing versus Traditional Prebriefing in clinical simulation scenario on Ischemic Stroke Management.

Methodology

Seventy-two PGDEMS students were chosen for the study by convenience sampling. The students were divided into two groups, A and B of 36 each after matching for age, sex and previous course grades.

On the day of Simulation session, Group A was administered traditional prebriefing while Group B underwent Concept Map Prebriefing on the topic of Ischemic Stroke.

Group A was shown a powerpoint presentation on assessment and management of Ischaemic Stroke and Group B was taught the algorithm of assessment and management of Ischemic Stroke by a concept map devised by Danielle Devine[10]

Both groups were given an orientation of the simulation lab, manikin and supplies . The prebriefing concluded with narration of a case of Ischemic stroke.

The prebriefing session lasted for 25-30 minutes for both groups followed by actual simulation session for 10 minutes. Prebriefing by both methods was conducted by the same trainer to avoid trainer bias.

Each group was further subdivided into 6 smaller groups for ease of conducting assessment. The Simulation session was followed by a structured debriefing for each subgroup lasting for 20 minutes.

The entire simulation session was video recorded with consent of the students and were later reviewed by two educators to avoid bias. The competency performance was scored using The LAPSS survey. The

score obtained by a group could range from 0 to 8.

The data was tabulated and compared for difference in means.

Result

Table 1. Traditional Prebriefing Group: The below tables show the scores obtained by each group on the items of LAPSS survey.

CRITERIA	Subgroup 1	Subgroup 2	Subgroup 3	Subgroup 4	Subgroup 5	Subgroup 6
Age over 45 years	Y	Y	Y	Y	Y	N
No prior History of Seizure Disorder	N	N	Y	Y	N	N
New onset of Neurologic Symptoms in last 24 hours	N	N	Y	N	N	Y
Patient was ambulatory at baseline	Y	Y	N	N	N	N
Blood Glucose between 60 and 100	Y	Y	Y	Y	Y	Y
Facial Grimace	Y	Y	Y	N	Y	N
Grip	Y	Y	Y	N	Y	N
Arm Weakness	Y	Y	Y	Y	Y	N
Y Score out of 8	6	6	7	4	5	2

KEY: Y indicates '**assessment done'** as per LAPSS survey

N indicates '**assessment not done'** as per LAPSS survey

Table 2. Concept Map Prebriefing Group

CRITERIA	**Subgroup 1**	**Subgroup 2**	**Subgroup 3**	**Subgroup 4**	**Subgroup 5**	**Subgroup 6**
Age over 45 years	Y	N	Y	Y	Y	Y
No prior History of Seizure Disorder	Y	N	Y	Y	N	Y
New onset of Neurologic Symptoms in last 24 hours	Y	Y	Y	Y	Y	Y
Patient was ambulatory at baseline	Y	Y	Y	Y	Y	Y
Blood Glucose between 60 and 100	Y	Y	N	Y	Y	Y
Facial Grimace	Y	Y	Y	Y	Y	Y
Grip	Y	Y	Y	Y	Y	Y
Arm Weakness	Y	Y	Y	Y	Y	Y
Y Score out of 8	8	6	7	8	7	8

Discussion

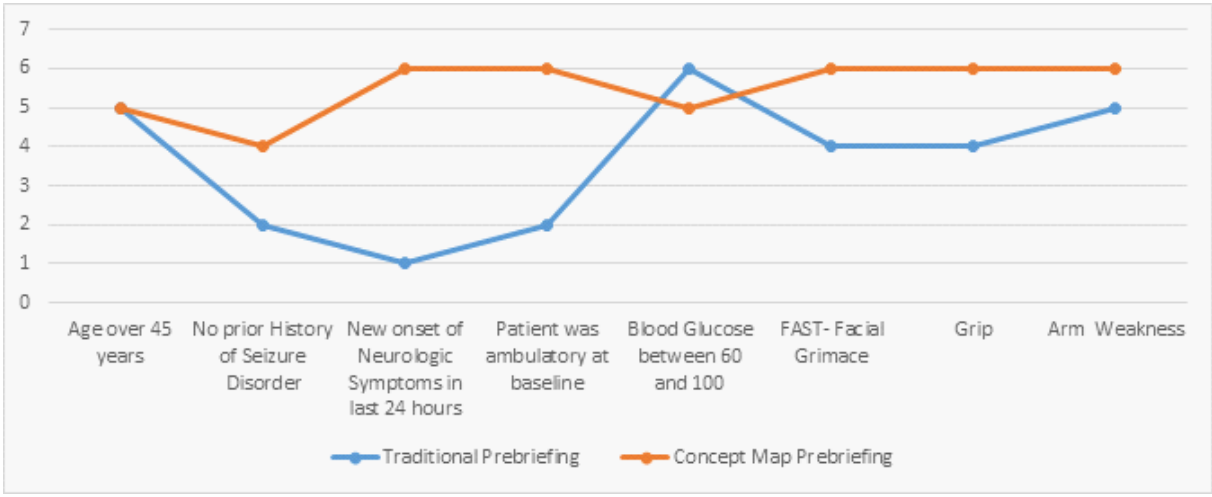

Figure 1. : Average score obtained on each parameters in Concept Map based Prebriefing versus Traditional Prebriefing Groups

As seen in figure 1. the students prebriefed by the concept map methodology scored better than their peers on a number of parameters including key points in history taking.

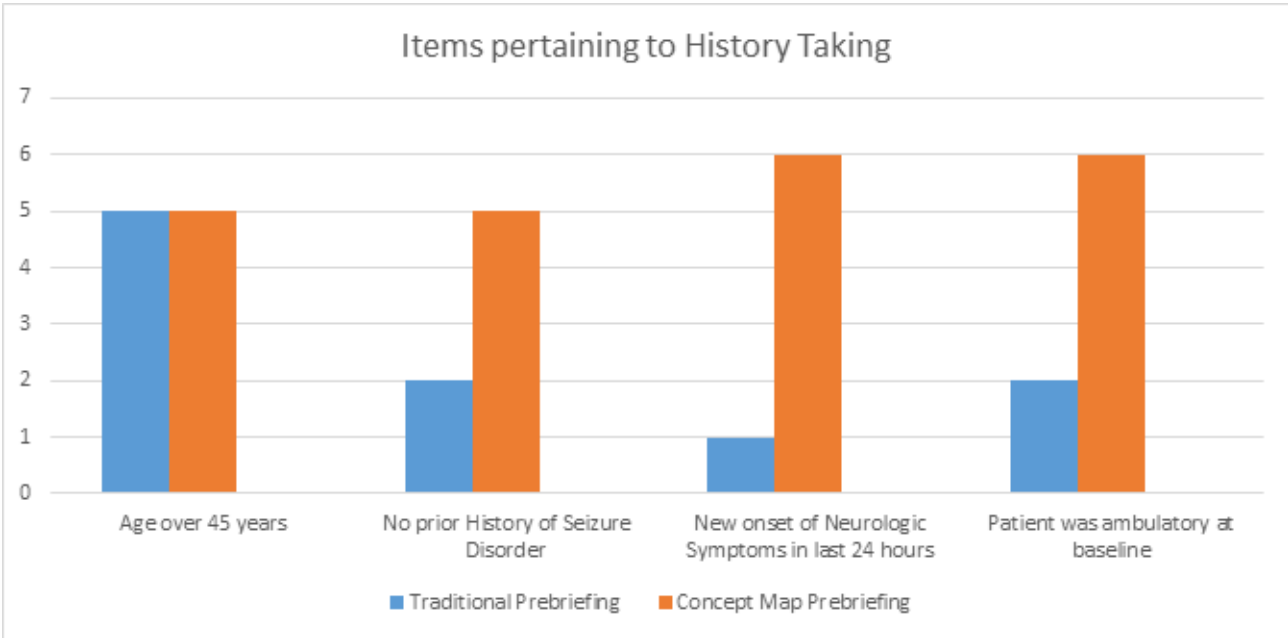

Figure 2: Items pertaining to History Taking

Five out of 6 subgroups of students who had concept map prebriefing were successful in ascertaining the age of patient as being over 45 years and history of past seizure whereas all 6 groups were successful in seeking history of existence of neurologic symptoms in last 24 hours and the information regarding ambulation of patient before the event. Contrastingly the students who underwent traditional prebriefing performed poorly on the history taking with four of the six groups failing to inquire about history of prior seizure and ambulatory status while only one group found it significant to inquire about the history of neurologic symptoms in last 24 hours.

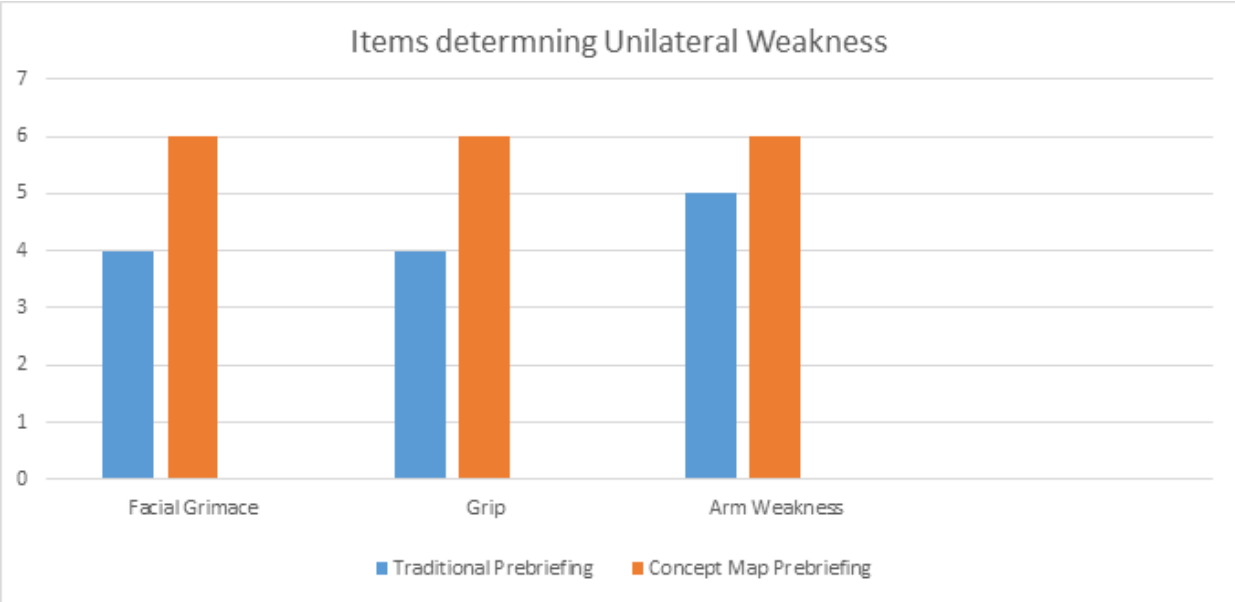

Figure 3. Items determining unilateral weakness

As seen in figure 3, in terms of clinical examination all the concept map prebriefing subgroups performed excellently and assessed all the three key parameters for unilateral weakness.

The traditional prebriefing subgroups weren't far behind in accurate assessment. Although two subgroups missed assessing the facial grimace and grip.

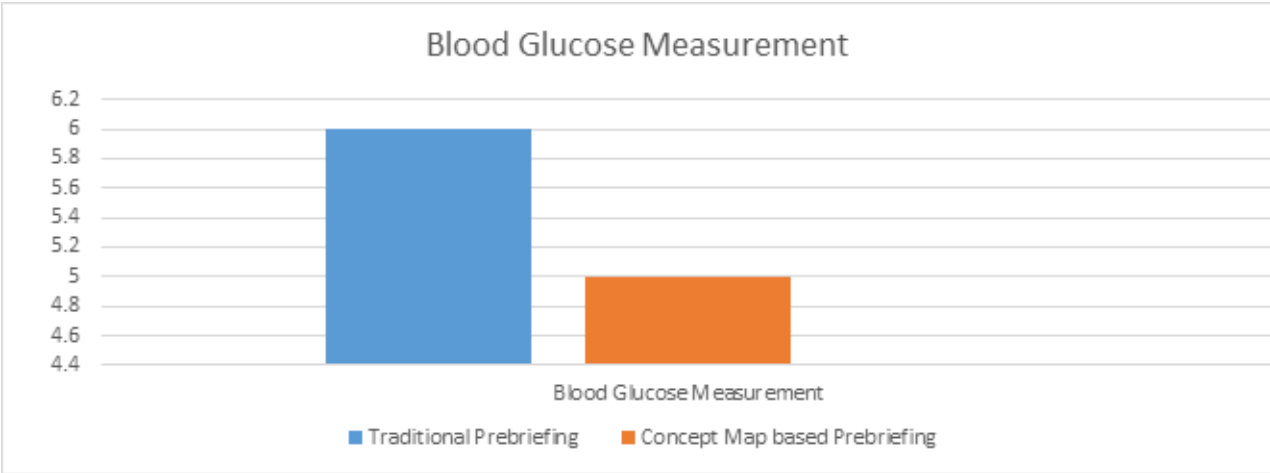

Figure 4. Blood Glucose Measurement

The concept map prebriefing subgroup did not cover the aspect of blood glucose measurement in a suspected stroke patient. This was reflected during the simulation activity when one subgroup failed to perform this action. All subgroups in the traditional prebriefing successfully carried out blood glucose measurement.

LAPSS is a reliable tool to assess competency performance in an ischemic stroke patient. The above findings emphasize the role of comprehensive concept map prebriefing in impacting the student performance as measured by the LAPSS survey.

Concept maps help users develop critical thinking and clinical judgment to support informed decision-making. It enables them to use pre-existing knowledge and their assessment of a situation to develop clinical decision-making skills. The cyclical, rather than linear nature of learning, in terms of reflecting on prior experience during prebriefing for example facilitates the continual development of decision-making skills and competent judgment in practice, and contributes to a more meaningful experience.

Conclusion

Traditional prebriefing orients the student to simulation environment but is found to be inferior to concept map prebriefing in terms of improving competency performance assessment in ischemic stroke. Further studies involving more students and multiple simulation sessions would be required to reaffirm the findings.

Source of Funding: Self

Conflict of Interest: Nil

Ethical Clearance: Taken from IEC, SIU

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Incidence, Prevalence and Mortality Rates of Malaria in India, 1990-2015: An Analysis for the Global Burden of Disease Study

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Abstract

Introduction: Malaria is the most important parasitic diseases of humans and one of the leading causes of morbidity and mortality in tropical countries as far parasitic disease is concerned. India is the most populous country in which malaria is common. About 95% population in the country resides in malaria endemic areas and 80% of malaria reported in the country is confined to areas consisting 20% of population residing in tribal, hilly, difficult and inaccessible areas.

Data &Methods: In this study, the 2015 global burden of diseases, injuries and risk factors (GBD) data were used to measure the incidence, prevalence, mortality, and disability-adjusted life years lost (DALY) rates of malaria during 1990–2015.Age and gender-specific causes of death for malaria were estimated using cause of death ensemble modeling.

Result: The number of new cases of malaria declined from 82.16million (95% UI 41.22–151.76 million) in 1990 to 74.83 million (95%UI 34.72–144.45) in 2015.Age-standardized mortality rate of malaria has declined by 41.07% between 1990 and 2015.The number of DALY due to malaria decreased from6.41 million (95% UI 5.52–7.42 million) in 1990 to 3.76million (95% UI 2.95–4.79 million) in 2015 with a total reduction of 41.31%.

Conclusion: India has achieved the MDG target related to malaria. In order to achieve SDG target of eliminating malaria by 2030, the Strategic Plan should aims at improving the availability and access to health care primarily to people residing in high-risk geographic areas, women and children.

Key words: *Malaria, Mortality, Incidence, Prevalence, DALY*

Introduction

Malaria is the important parasitic diseases of humans and one of the leading causes of morbidity and mortality in tropical countries as far parasitic disease is concerned. Once believed and preached that most serious and life-threatening complications of malaria patients are caused only by *Plasmodium falciparum* infection, while *Plasmodium vivax* infections are relatively mild, run a benign course and usually do not require hospitalization is changing. The malaria-endemic countries with limited health facility are still more prone to death due to malaria.[1-2]

India is the most populous country in which malaria is common.[1]More than 90% of country population settles in malaria endemic area. Also, 80% of malaria reported in the country is constrain to area with around 20% of population nest in tribal, hilly and difficult to reach areas.[3]The cases and deaths reported by the Indian Government are concentrated mainly in a few states in east and northeast India.[4] Because the Indian national malaria Programme cures nearly all the cases it treats, it detects only about 1000 malaria deaths each year, and misses most deaths caused by malaria.[5] WHO estimates

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that malaria causes only about 15000 deaths each year in India (5000 children, 10000 adults), but this too depends indirectly on the low death rates in diagnosed patients.[1]Small studies in specific regions of India or in special sub populations cannot directly estimate national numbers of malaria deaths.[5–13]

India has experienced malaria burden from the time long past. In 1950s India faces the worst period of malaria incidences with 75 million estimated cases and about 0.8 million deaths per year.[3]The launch of the National Malaria Control Program (NMCP) resulted in a drastic drop of malaria cases to less than 50,000 with no reported malaria mortality in 1961. However, malaria staged a dramatic comeback, with 6.45 million estimated malaria cases in 1976.[14]Since then, a downward trend of reported cases has begun, though slowly, as confirmed cases came down from 3 million in 1996 to 1.8 million cases with about 1,000 deaths in 2005[15] and 1.5 million reported cases and 1173 deaths in 2007.

According to the World Malaria Report 2014, 22% (275.5m) of India's population live in high transmission (> 1 case per 1000 population) areas, 67% (838.9m) live in low transmission (0–1 cases per 1000 population) areas and 11% (137.7m) live in malaria-free (0 cases) areas.[16] In 2013, 0.88 million cases have been recorded, with 128 million tests being conducted on the suspected cases, with P. falciparum causing 53% and P. vivax causing 47% of the infections. The incidence of malaria in India accounted for 58% of cases in the South-East Asia Region of WHO.[16]

The World Health Organization (WHO) recently launched the global technical strategy (GTS) for malaria, which aims to reduce the incidence and mortality rates of malaria at least by 90% by 2030.To achieve the GTS and SDG malaria targets, malaria endemic countries should have robust surveillance and health management information systems to monitor mortality and incidence rates of malaria.[17]

In the present article, global burden of diseases, injuries and risk factors-2015 (GBD) data[18–21]were utilized to estimate the incidence, prevalence, mortality, and disability-adjusted life years lost (DALY) rates of malaria for the period 1990–2015.

Method

India, with a population of nearly 1.25 billion, is the second most populous country in the world with diverse population. The unique geographic position of India in the world makes it one of the most topographically and climatically diverse country. In India, malaria cases are reported almost throughout the year, since a perfect combination of average temperature (15-30°C), rainfall and precipitation-inducing conditions persist across the different parts of the country over all the seasons.[22]The eastern and central regions of India are the most exposed to malaria.[23]

Data sources

The comprehensive source of data and rigorous analysis has been used by GBD 2015 to measure cause-specific mortality rates and risk factors for 188 counties. [20]The key sources of data to model the burden of malaria in India included verbal autopsy (VA), Medical certification of cause of deaths, National Family Health Surveys (NFHS), other surveys on cause of death and published scientific articles.[20]

Causes of death modelling

Causes of death by age groups, gender and year for malaria were measured using ensemble modeling (CODEm) by the GBD collaborators. A detailed description of CODEm is reported elsewhere.[18,20,24-25]. CODEm tests a various models, for example mixed effects linear models and spatial–temporal Gaussian process regression (ST-GPR)models and formulate an ensemble model rest on the performance of the different models.[20] In this model, uncertainty intervals (UI) are generated by sampling the posterior distribution of each component model in proportional to the weight of each model in the ensemble. Vital registration and VA data were reformed for debris codes based on the GBD algorithm.[20]

DALY, due to malaria, was measured by summing years of life lost (YLL) due to premature mortality and years lived with disability (YLD), a measure of non-fatal health loss, in a single metric. One DALY can be considered as equivalent to one lost year of healthy life. YLL were approximated by using classic GBD methods by which each death is multiplied by the normative standard life expectancy at each age. YLD were determined utilizing sequelae disability weights and prevalence, which is obtained from the general public (a population-based study) of to earmark disability weights to each sequela and combination of sequelae.[26-27]

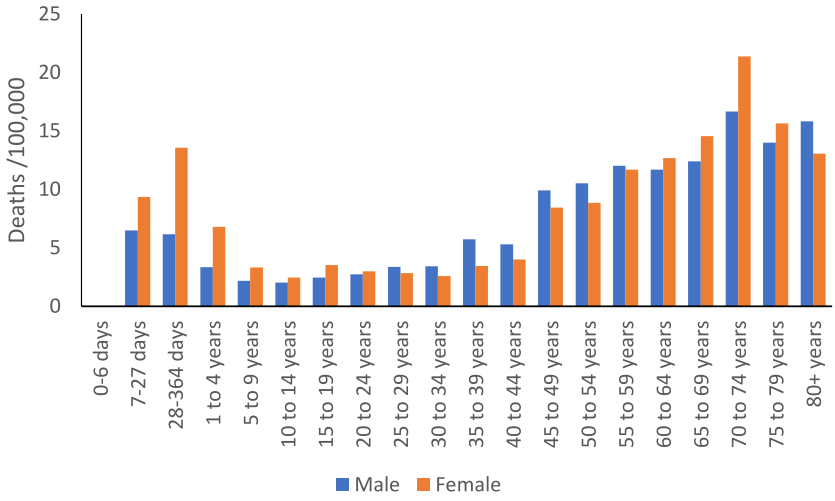
Results

The number of new cases of malaria declined from 82.16million (95% UI 41.22–151.76 million) in 1990 to 74.83 million (95%UI 34.72–144.45) in 2015. Age-standardized incidence rate among all ages and gender declined by 30.43% over the 25 years. Malaria caused an estimated 87846.6 deaths (95% UI 77223.40–101061.07) in 1990 and 70703.34 deaths (95% UI 54588.13–94705.82) in 2015, a 19.52% reduction over the 25 years. Age-standardized mortality rate of malaria has declined by 41.07% between 1990 and 2015(Table 1).Malaria mortality rate was highest among neonates (7–27 days), post-neonatal infants (28–364 days) and older individuals (≥65 years) and lowest among individuals 10–14 years in both gender (Fig. 1).

The reduction of age-standardized incidence and mortality rates of malaria were more marked between 2005 and 2010. Like mortality and incidence rates, a reduction of (57.59%) was observed for the age-standardized prevalence rate over the last 25 years (Fig. 2).The number of DALY due to malaria decreased from 6.41 million (95% UI 5.52–7.42 million) in 1990 to 3.76million (95% UI 2.95–4.79 million) in 2015 with a total reduction of 41.31%. Similarly, age standardized DALY rate declined by 52.59% during the same period (Table 1).The reduction of age-standardized DALY rate was marked during 2005 and 2010 (Fig. 3). The age-standardized DALY rate was higher among neonatal and post-neonatal period compared to the other age groups (Fig. 1).

Table 1: Mortality, incidence, DALY and prevalence rates of malaria and percentage changes between 1990 and 2015

Measure	**1990 # or rate (95% UI)**			**2015 # or rate (95% UI)**			**% change between 1990 and 2015**
# deaths	87846.61	77223.40	101061.07	70703.34	54588.13	94705.82	-19.52
Age-standardized mortality rate/100000	10.42	9.36	11.69	6.14	4.75	8.16	-41.07
Prevalent cases	39446323.56	29940863.77	49361653.26	20299055.61	14861291.89	28402355.56	-48.54
Age-standardized prevalence rate/100000	3384.75	2612.86	4200.76	1435.40	1059.03	1993.78	-57.59
Incident cases	82163201.08	41227293.04	151767038.53	74838359.86	34724908.28	144455664.60	-8.91
Age-standardized incidence rate/100000	7561.26	3801.66	13653.88	5260.15	2442.48	10235.79	-30.43
#DALY	6418034.82	5523235.78	7427264.73	3766703.30	2952781.84	4792343.30	-41.31
Age-standardized DALY rate/100000	608.91	536.61	690.48	288.66	225.92	366.81	-52.59



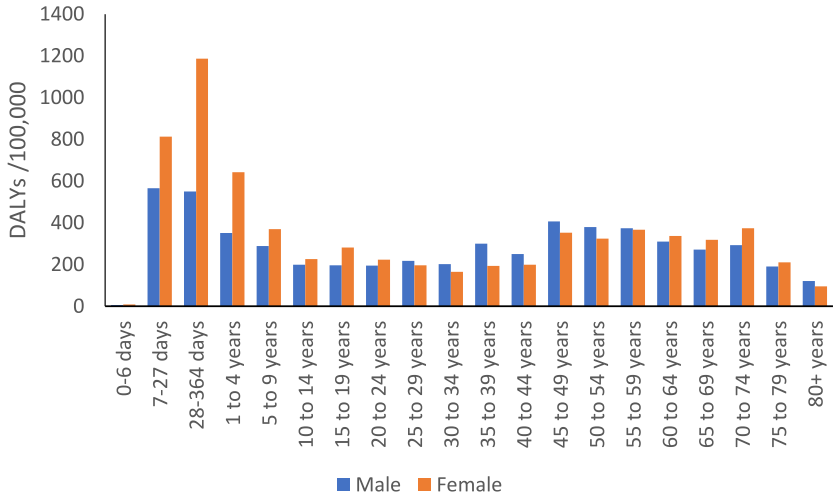


Fig. 1 Mortality and DALY rates by gender and age group in 2015

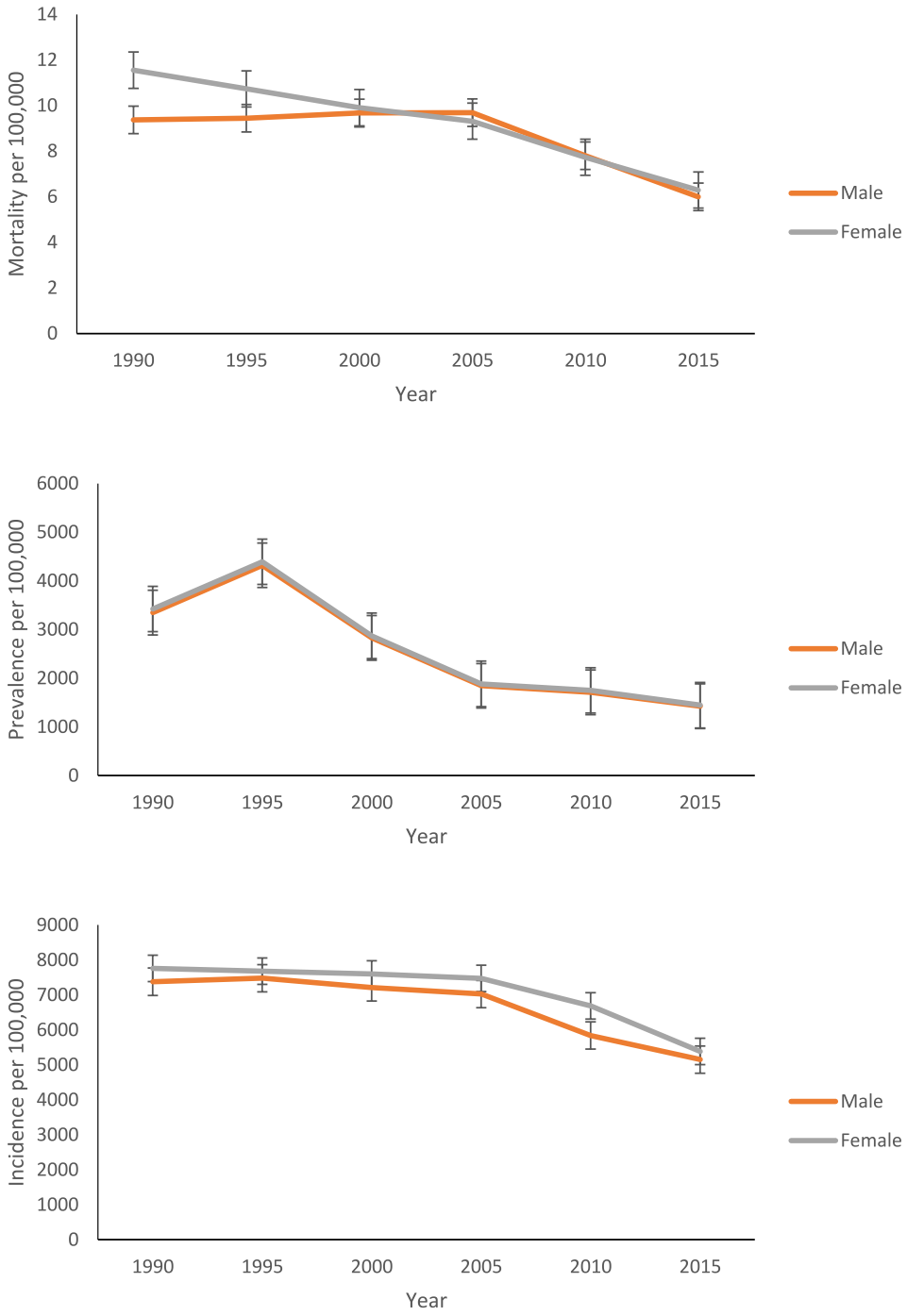


Fig. 2 Age- standardized malaria mortality, prevalence and incidence rates in males and females between 1990 and 2015

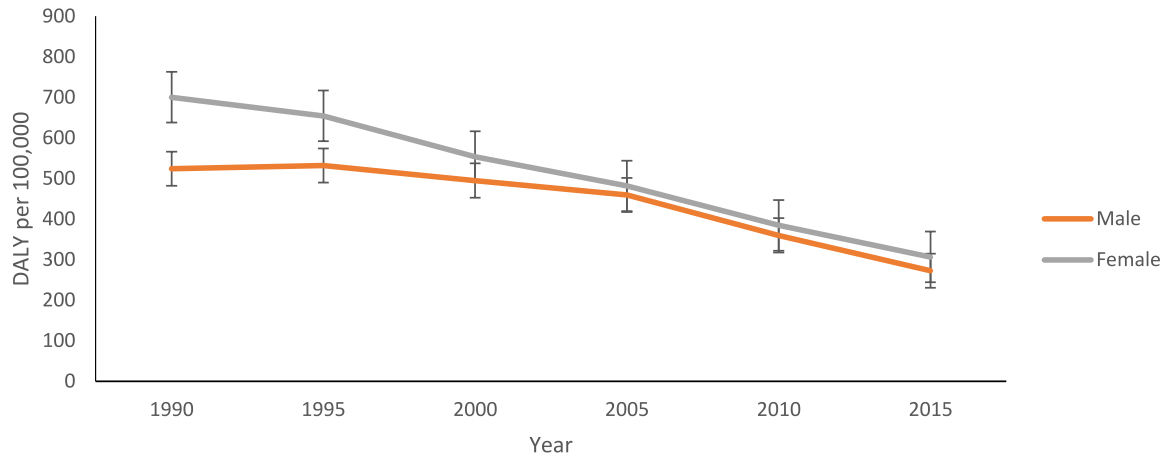


Fig. 3 Age-standardized DALY rates of malaria by gender and year

Discussion

There is a target (6C) in MDG which says of halting mortality rate from malaria by 2015 and begun to reverse the incidence of malaria. This target have been encouraging worldwide although there were variations among regions and countries.[28]India has shown some progress in reversing the burden of malaria in the last two decades. Mortality and incidence rates of malaria declined by around 41% and 30%, respectively, between 1990 and 2015 [Table 1].

As per the report of WHO, in Southeast Asia out of total malaria cases India contributes 77%. Most of the population has little or no immunity towards malaria due to the low and unstable transmission dynamic. However, some surveys have shown that in some foci, mainly in forested areas, the transmission intensity is very intense with the disease burden to a large extent concentrated in children. Malaria is particularly entrenched in low-income rural areas of eastern and north-eastern states, but important foci are also present in the central and more arid western parts of the country. About 95% population in the country resides in malaria endemic areas and 80% of malaria reported in the country is confined to areas where 20% of population resides in tribal, hilly, hard-to-reach or inaccessible areas.[29]

In India malaria cases have consistently declined from 2.08 million in 2001 to about 8.4 lakhs in 2017.[30]Malaria control measures in India include improved access to early diagnosis, the involvement of the accredited social health activists (ASHAs) at the community level, the introduction of artemisinin-based combination therapy, and intensified vector control, including long-lasting insecticidal nets (LLINs). In most of the states, the recent declines in malaria cases and mortality have been achieved chiefly through the successful control of P. falciparum, though malaria control programs have had footprint on both Plasmodium falciparum and P.vivax malaria, [31]

For prevention and control of vector borne diseases (like malaria) the National Vector Borne Disease Control Programme (NVBDCP) is an umbrella programme. The attention of the NVBDCP is on resource challenged settings and vulnerable groups.[29]NVBDCP has developed the national strategic Plan (NSP) with the support of WHO to provide a road map for making India malaria free by 2027.[30]

However, the malaria control strategy also faces several challenges to achieve WHO's targets to reduce malaria mortality and incidence rates. Lack of service providers, especially health workers and laboratory technicians, compounded by shortage of health assistant/ supervisors (Male), malaria inspectors and assistant malaria officers is a main factor affecting surveillance and service delivery, particularly in remote areas. Also, in many districts virtual absence of Rapid Response

Teams for epidemic/outbreak response is pronouncing. There is still a large gap in allocation for scaling up specific interventions like provision of RDTs, ACT and LLINs, and for positioning health care delivery and management staff both at district level and state levels to successfully attain universal coverage and impact.[29]

Moreover, inadequate malaria knowledge at community and household level, inadequate community mobilization, and inadequate appreciation of malaria as a serious disease with related consequences hinders the target.

Conclusion

India has achieved the MDG target related to malaria. In order to achieve SDG target of eliminating malaria by 2030, the Strategic Plan should aims at improving the availability and access of health care primarily to women and children. As a further matter, improving surveillance and taking care of difficult to reach areas play a crucial role in controlling spread of the disease with a view towards achieving sustainable development goal.

Ethical Clearance: Not required.

Conflict of Interest: None

Funding: None

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Effectivness of Structured Exercise Protocol for Post Menopausal Stress Urinary Inncontinence

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Astract

Aim: To study the effect of structured exercise protocol for post menopausal stress urinary incontinence .

Objectives: To evaluate the effectiveness of structured exercise protocol for post menopausal stress urinary incontinence.

Methods: Ethical clearance was obtained from the Institutional Ethical Committee, KIMSDU, Karad. Initially the awareness program was conducted in karad and nearby areas. The selected sample was then studies at Krishna hospital, karad. 58 patients were equally divided into two group using convenient sampling with random allocation.Group A (n=29) , Group B (n= 29). Baseline treatment was IFT and bladder training program. Group A was given structured exercises, Group B was given conventional exercises.Outcome measures were analyzed after 6 weeks.

Result: Intergroup comparison in group A result showed improvement in pad test (p= <0.0001).Group B was statistically extremely significant in improvement in pad test (p = 0.0002).Group A result showed that improvement in pelvic floor muscle strength (p= <0.0001). whereas Group B showed improvement in pelvic floor muscle strength (p=<0.0001). Group A result showed improvement in all parts of kings health questionnaire (p=0.0001) and group B also showed improvement in kings health questionnaire (p= 0.0001)

Intra group analysis reviled one hour pad test, KHQ, PFM strength considered significant in both groups.

Conclusion : The study concluded that structured exercises protocol along with IFT and bladder training was equally effective in reducing dribbling of urine, improvement in QOL, PFM strength.

Key Words : *Urinary incontinence, Post menopausal women , Bladder training, Structured exercises protocol , IFT*

Introduction

Post menopause is the final stage of climetric during which stress urinary incontinence is more common. Among the symptoms stress urinary incontinence interferes in the ADL. Recurrent symptoms of vaginal dryness, hot flushes, etc. lead to urinary tract infection. Prevalence of stress urinary incontinence is 16. 13 % [1]. Estimated age for menopause world widely accepted is 45-55 years[2,3,4]. Causes of stress urinary incontinence are Pelvic floor muscle weakness or damage, Hyper mobility of the urethra, Persistent heavy straining, Chronic coughing, Neurologic damage, Decreases estrogen during the menopause [5,6] **Structured exercises:**

Specific goal oriented treatment used for treat urinary incontinence such as breathing reeducation, functional exercises with use pelvic floor muscles, modified pilates exercises and progressive vaginal cone exercises.

Effect of structured exercises :

- Improve strength of pelvic floor muscles
- Reduced stress urinary incontinence
- Improve quality of life

Interferential current therapy (IFT)

Interferential therapy helps to improve control of urination, interferential current stimulates the pudential nerve which causes the detrusar muscle inhibition and there is action of slow twitch muscle fiber which causes the control of urination [7].

Bladder training

Behavioral therapy has been used for urinary incontinence since 1940. The aim of behavioral therapy is to improve bladder control by changing the patient's behavior, especially patients voiding habits and by teaching skills for preventing urine loss. There are number of approaches for behavioral therapy which include bladder drill and bladder training, and promote voiding [8]

Method

- Study type: Experimental study
- Study design: Consecutive sampling with random allocation
- Study duration: 1 year
- Sample size: 29+29 = 58
- Place of study: Krishna Hospital, Karad

Criterion of the study

Inclusion criteria:

- Age group of 45- 65 years.
- Subject having history of urinary stress incontinence present at least 4 months.

Exclusion criteria:

- Disable subjects
- Psychiatric illness
- Subjects waiting for surgical treatment
- Subjects with spinal surgery
- Subjects with grade 3 and grade 4 osteoarthritis

Rocedure

An approval for the study was obtained from the Protocol committee and institutional Ethical Committee of KIMSDU. Awareness program was carried out for women in karad and surrounding rural areas near Krishna hospital.

It was a comparative study conducted in the Physiotherapy Department of Krishna Institute of Medical Sciences. 58 patients were equally divided into two groups using convenient sampling with random allocation . Baseline treatment was given both groups which consist IFT and bladder training . Group A was given structured exercise protocol , Group B was given conventional exercises .The patient were selected according to inclusion and exclusion criteria. Written informed consent was taken and the whole study was explained to them . detailed evaluation was done to screen the patients.

Group A – structured exercises , IFT , bladder training (with progression)

Group B – conventional exercises , IFT , bladder training (with progression)

Exercises were gave for 6 weeks / 3 alternative days

After completing 6 weeks with 3 sessions per week, post-test assessment was taken by using one hour pad test , kings health questionnaire , pelvic floor muscle strength .

The interpretation of the study was done on the basis of comparing pre-test and post-test assessment using outcome measures and were statistically analysed.

Following exercises were given for Group A and B:

Group A (Structured exercises)	Group B(conventional exercises)
Breathing Reeducation	Manual Facilitation
Functional Exrcises with Using Pelivic Floor Muscle	Gravity Elimination Exercises
Modified Pilates	Activation of Core Stabilization Exercises
Progressive Vaginal Cone Exercises	Squatting Exercises

Results

Table No 1 : Comparison of one hour pad test within group

	Pre	Post	P Value	T Value	Intererence
Group A	13.990±6.638	9.8955±6.757	<0.0001	7.233	Considered Extremly Significant
Group B	11.525±6.775	9.0187±5.725	0.0002	4.267	Considerd Extremly Significant

Table No :2 COMPARISION OF PELVIC FLOOR MUSCLE GRADINGS WITHIN THE GROUPS

	Pre	Post	P Value	T Value	Intererence
Group A	2.0344±0.421	3.6551±0.552	<0.0001	17.674	Extremly Significant
Group B	2.586±0.7328	3.931±0.7987	<0.0001	6.519	Extremly Significant

Table No :3 Comparison of kings health questionnaire within group

	Pre	**Post**	**P Value**	**T Value**	**Intererence**
GROUP A					
Part 1	2.63±0.596	2.093±0.60	0.0009	3.679	Extremely significant
Part2	5.40±1.127	3.475±1.118	<0.0001	9.923	Extremely significant
Part3	2.103±0.5571	1.310±0.6038	<0.0001	6.327	Extremely significant
GROUP B					
Part1	2.689±0.4100	2.103±0.3868	<0.0001	9.589	Extremely significant
Part2	4.862±1.031	4.137±0.7858	0.0048	3.065	Extremely significant
Part3	2.206±0.4123	1.793±0.4123	<0.0001	4.446	Extremely significant

Table no :4 Comparison of pre-pre and post-post one hour pad test score between the groups

	Pre Test	**Post Test**
Group A	13.990.±6.638	11.525±6.775
Group B	6.866±3.75	10.159±6.322
P Value	0.1672	0.0191
Inference	Considered Not Significant	Considered Significant

Table : 5 Comparison Of Pre-Pre And Post-Post Pelvic Floor Muscle Strength Score Between The Group

	PRE TEST	**POST TEST**
Group A	2.0344±0.4211	4.3796±0.5615
Group B	2.2068±0.4913	3.6895±0.7123
P value	0.11569	0.0001
Inference	considered not significant	considered extremely significant

Table No:6 Comparison of pre-pre and post-post kings health questionnaire score between the groups part 1,2,3

PART 1	pre test	post test
Group A	2.637±0.5961	2.0931±0.6307
Group B	2.689±0.4100	2.103±0.3863
P value	0.7017	0.940
Inference	considered not significant	considered not significant
PART 2		
Group A	5.403±1.127	3.4758±1.118
Group B	4.862±1.031	4.137±0.7858
P value	0.0615	0.0116
Inference	Not quite significant	not significant
PART 3		
Group A	2.103±0.557	1.310±0.6038
Group B	2.206±04123	1.793±0.4123
P value	0.4249	0.0008
inference	Not significant	extremely significant

Discussion

SUI is serious medical condition that causes perineal rashes, pressure ulcers and urinary tract infection. . SUI causes psychological stress, disability, social seclusion and economic burden , problems in sexual relationship, decreased quality of life

40% women suffering from menopause have problem of UI with vasomotor symptoms and termed as menopause syndrome.[9,10]

Reviewing various studies , it was analyzed that the use of electrical nerve stimulation kegal exercises and surgical intervention were the line of treatment routine used for urinary stress incontinence .

The study was undertaken considering all the mentioned points, and the aim of the study was evaluate effectiveness of structured exercise protocol for post menopausal stress urinary incontinence .

In this study , 58 subjects with post menopausal stress urinary incontinence fulfilling the inclusion and exclusion criteria , between age group 46-65 years were taken. Out of 58 subjects Group A had 29 females and Group B had 29 females The mean age of the participants in group A was 52.41±4.99 and in group B 52.62±5.63, which shows there is no significant difference between the mean ages of participants in both groups,

Structured exercises with progression like diaphragmatic breathing exercises which are useful to improve pelvic floor muscle strength is found significant in preventing urinary incontinence. In this the diaphragm moves caudally, enlarge thoracic cavity, anterior wall bulges outward, this decreases urethral pressure and prevent urinary incontinence which in turn helps to relax abdominal muscles.[11]

Functional exercises such as hip abduction and adduction combined with pelvic floor muscular contractions help in increasing levator ani muscles to

produce force which may help to improve endurance and strength of pelvic floor muscles. [12] Stability exercises like dead bug exercise might have help to improve stability and coordination of the movements and maintain spinal stability [13] Modified pilates exercises is an approach which involves slow controlled movements focusing on posture and breathing, these form of exercises help to increase flexibility of whole body rather than specific muscles [14]A weighted vaginal cone helps to improve strength of pelvic floor muscles

In the study, within group analysis of one hour pad test score reveled statically reduction in dribbling volume of urine after the intervention in both group. This test was done by using paired T test. Inter group analysis of one hour pad test score was done by using unpaired t test. Pre intervention analysis showed no significant difference between group A and Group B (p=0.1672). Post intervention analysis showed significant difference between group A and group B (P= 0.0191). Thus in this study the dribbling of urine was reduced after session of both groups. So dribbling volume of urine was reduced after the 6 week session treatment of both groups, the treatment method were similarly effective in both groups. The reduction of dribbling of urine can be explained possibly due do stimulation of pudental nerve which trigger long latency spinal cord reflex response. In addition to direct motor response, this reflex stimulus causes a contraction of pelvic floor muscle. These contraction strengthen pelvic floor muscle, elevating neck of bladder and resist the outflow of urine.

For assessing quality of life, kings health questionnaire was used. Kings health questionnaire is a subject's self administered self report and has 3 parts consisting of 21 items. .

In this present study, both groups showed significant improvement in kings health questionnaire score. However there is no significant difference in part 1 and part 2 and there is significant difference in part 3 .After the 6 weeks subjects can self analyze the all component of kings health questionnaire and felt difference after the treatment

Part 1,2,3 showed reduction in kings health questionnaire score , this could be possibly due to improvement In strength of pelvic floor muscle and relaxation technique

elvic floor muscle strength was evaluated by using oxford pelvic floor muscle grading .

In the present study, pelvic floor muscle strength showed significant improvement in both groups, however the post session analysis between the groups showed structured exercise protocol was better than conventional exercises program. In structured exercises program subjects involvement was better because of help of swiss ball, verbal stimulus and biofeedback , so participants were able to initiate contract PFM.

The result from the statistical analysis of present study supports alternative hypothesis which stated that there is equal beneficial effect to subjects treated with structured exercise protocol and conventional exercises in post menopausal stress urinary incontinence. Hence above study showed that subjects treated with structured exercises and conventional exercises showed better strength, quality of life and reduces stress urinary incontinence . This study is simple , safe, and physical procedure like structured exercises adjunct with interferential current therapy are helpful in trating urinary incontinence in post menopausal women.

Conclusion

Hence , on the basis of the results of our study , it was concluded that structured exercise program along with IFT , bladder training and conventional physiotherapy along with IFT , bladder training shows improvement in quality of life, pelvic floor muscle strength ,volume of dribbling of urine in post menopausal women who suffering from stress urinary incontinence.

Conflict of Interest: The author declares that there are no conflicts of interest concerning the content of the present study.

Funding: The study was funded by Krishna Institute of Medical Sciences Deemed to be University, karad.

Ethical Clearance: The study was approved by Institutional Ethics Committee, KIMSDU

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Treatment Success Rate among Multi-Drug Resistant Tuberculosis Patients Registered Under Programmatic Management of Drug Resistant Tuberculosis Services in District Amritsar, Punjab, India

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Abstract

Background: MDR-TB has become an urgent public health problem worldwide, threatening the global TB control. The success rate of treating multi drug resistant remains very low.

Method: This cross-sectional study was conducted on all MDR-TB patients who were registered and being treated under PMDT services in Amritsar district from 1st January 2015 to 31st December 2016. The treatment outcome with their clinico-demographic determinants was ascertained. Data management and analysis was done by using Microsoft excel and SPSS.

Results: Out of 110 registered MDR-TB patients, 88 (80.0%) were males and 22 (20.0%) were females. The various treatment outcomes observed were- 36 (32.7%) cured, 20 (18.2%) treatment completed, 16 (14.5%) defaulted, 22 (20.0%) died, 11 (10.0%) regimen changed or shifted to XDR TB regime, 5(4.5%) transferred out. The success rate (cured+ treatment completed) was 50.9%.

Conclusions: On statistical analysis, it was observed that age (p=0.012), weight band of patients under RNTCP (p=0.040) were significantly associated with the treatment outcome. Other factors like sex, residence, type of tuberculosis and the HIV status of the patient did not affect the treatment outcome.

Keywords: *Multi-drug resistant TB, Treatment outcomes, success rate.*

Introduction

The emergence of Multidrug-resistant TB (MDR TB) has created increasing constraints on effective tuberculosis control and has caused tremendous morbidity and mortality worldwide. Globally in 2017, there were an estimated 558 000 new cases of Rifampicin resistant TB (RR-TB), of which almost half were in three countries: India, China and the Russian Federation. Among RR-TB cases, an estimated 82% had multidrug-resistant TB (MDR-TB). Globally, 3.5% of new TB cases and 18% of previously treated cases had MDR/RR-TB, with the maximum proportions (>50% in previously treated cases) in countries of the former Soviet Union.[1] The treatment of MDR-TB, is long, expensive and requires the use of toxic drugs and has substantially lower success rates than for drug-sensitive TB.[2]

Despite progress in tuberculosis (TB) control, the response to the multidrug- resistant TB continues to be limited. Treatment success remains low, at 55% globally.[1] This is considered to be one of the major challenges to progress towards the country's targets to end TB by 2025. While prevention of development of drug resistance is of paramount importance for ending TB, early detection and treatment completion are keys to interrupt on-going transmission.[3] Therefore, it is imperative to analyze the treatment outcomes of MDR-TB patients treated by standardized 2nd line chemotherapy. Hence the present study was planned to investigate the treatment outcomes and to assess the impact of different demographic and clinical conditions

on the outcome among MDR-TB patients.

Method

The study was a cross-sectional study conducted on all MDR-TB patients registered and being treated with second line anti-tuberculosis drugs under Programmatic management of drug resistant tuberculosis services in Amritsar City.

Study sample

All MDR-TB patients registered from 1st January 2015 to 31st December 2016.

Inclusion criteria

All drug sensitivity tested (DST) confirmed MDR-TB cases who signed written informed consent.

Exclusion criteria

Critically ill patients and pregnant females were excluded from the study.

Data collection and analysis

A total of 110 patients registered with District Tuberculosis Centre (DTC), Amritsar and being treated with second line anti TB drugs were included in the study. A pre-designed and pre –

tested proforma was administered to the subjects after taking his/her consent. The consent of the caretaker or guardian/parent was sought on behalf of all child participants. Questionnaire included questions regarding the socio-demographic and clinical profile, of the patients. The possible outcomes of the MDR TB patients under DOTS can be: cured, treatment completed, died, failure, defaulted, regimen changed/shifted to XDR and transferred out.[3]

Cured: Treatment completed as recommended by the national policy without evidence of failure and three or more consecutive cultures taken at least 30 days apart during CP are negative including culture at the end of treatment.

Treatment completed: Treatment completed as recommended by the national policy without evidence of failure but no record that three or more consecutive cultures taken at least 30 days apart are negative after the intensive phase.

Failure: Treatment terminated or need for permanent regimen change of at least two or more anti-TB drugs in CP because of lack of microbiological conversion by the end of the extended intensive phase or microbiological reversion in the continuation phase after conversion to negative or evidence of additional acquired resistance to FQ or SLI drugs or adverse drug reactions .

Died: A patient who dies for any reason during the course of treatment.

Transfer out: A patient who has been transferred to another reporting unit (DR-TB Centre in this case) and for whom the treatment outcome is not known.

Regimen changed/shifted to XDR: A TB patients need for permanent regimen change of at least one or more anti-TB drugs prior to being declared as failed/A MDR-TB patient who is found to have XDR-TB by an RNTCP certified CDST laboratory and who has subsequently switched to a regimen for XDR-TB treatment initiation.

Outcomes were classified as Favourable outcome which includes cured and treatment completed patients and Unfavourable outcome that includes cases with outcome as defaulted, died, transferred out and those who were shifted to XDR TB or changed regime. Cured and treatment completed, these together define treatment success.

All the information so collected was compiled, analyzed statistically with help of SPSS version 20.Chi-square test was used to evaluate differences in categorical variables and $p<0.05$ was considered to be significant.

Ethics: The research proposal was approved by the college ethical committee at the time of commencement of the study.

Source of Funding: Nil

Conflict of Interest: Nil

Table 1 Treatment outcome of multidrug resistant TB patients

Outcome	Frequency	Percentage
Cured	36	32.7
Treatment completed	20	18.2
Defaulted	16	14.5
Died	22	20.0
Regimen changed /Shifted to XDR	11	10.0
Transferred out	5	4.5

Table 2: Distribution of cases showing the demographic and clinical factors affecting the treatment outcome.

	Treatment Outcome		Significance
Characteristics of patient	Favourable* (n=56)	Unfavourable** (n=54)	
Age (years)			
11-25 (n=43)	30 (69.8)	13 (30.2)	$\chi2$=10.892 df=3 = 0.012
26-40 (n=41)	16 (39.0)	25 (61.0)	
41-55 (n=21)	9 (42.9)	12 (57.1)	
>55 (n=5)	1 (20.0)	4 (80.0)	
Sex			
Male (n=88)	43 (48.9)	45 (51.1)	$\chi2$= 0.737 df=1 =0.391
Female (n=22)	13 (59.1)	9 (40.9)	
Residence			
Urban (n=67)	34 (50.7)	33 (49.3)	$\chi2$= 0.02 df=1 = 0.966
Rural (n=43)	22 (51.2)	21 (48.8)	
Type of TB			
Pulmonary (n=107)	55 (51.4)	52 (48.6)	$\chi2$= 0.381 df=1 = 0.537
Extra-pulmonary (n=3)	1(33.3)	2 (66.7)	
Weight Bands			
26-45 (n=48)	19 (39.6)	29 (60.4)	$\chi2$= 6.42 df=2 = 0.040
46-70 (n=58)	36 (62.1)	22 (37.9)	
>70 (n=4)	1 (25.0)	3 (75.0)	
HIV status			
Non reactive (n=106)	55 (51.9)	51 (48.1)	$\chi2$=1.115 df=1 = 0.291
Reactive (n=4)	1 (25.0)	3 (75.0)	

*Favourable outcome included Cured and Treatment completed;

**Unfavourable outcome included Defaulted, Died, Regimen changed/shifted to XDR .

Results

A total of 110 patients with a diagnosis of MDR-TB were registered under PMDT services in Amritsar city during 2015–2016. The total sample comprised of, 88 (80.0%) males and 22 (20.0%) females. The mean age of the patient is 33.13 years (SD ±12.4 years), ranging 11 to 68 years. 84 (76.4%) cases were in the age group of 11-40 years. Most of the patients 88(80.0%) were males and 67(60.9%) patients resided in urban areas. Almost all patients, 107(97.3%) had pulmonary tuberculosis and only 3(2.7%) had extra-pulmonary tuberculosis. Maximum patients 58(52.7%) belonged to weight band of 46-70 kg .Only 4 (3.6%) patients were HIV positive. 7(6.3%) patients were resistant to both drugs Rifampicin and Isoniazid.

Table 1 shows the distribution of cases according to their treatment outcomes. Out of the total 110 patients, 36 (32.7%) were cured, 20 (18.2%) were categorized as treatment completed, 16 (14.5%) patients defaulted, 22 (20.0%) died, in 11(10.0%) patients regimen was changed or shifted to XDR TB regime and 5 (4.5%) patients were transferred out. Treatment success rate (cured and treatment completed) was 50.9% in the present study.

Table 2 depicts the clinical and demographic factors affecting treatment outcome in MDR TB cases. It is evident from the above table that favourable outcome was seen in younger age group i.e. 11-25 yrs. Out of 110 patients,30 (69.8%) patients had favourable outcome. Unfavourable outcome was seen in 80.0% of patients of more than 55 yrs age. The results were found to be statistically significant(p=0.012). 43(48.9%) males and 13(59.1%) females had favourable outcome. The results were not found significant. Favourable outcome was significantly higher among patients with weight band 46-70 kg i.e 36(62.1%) as compared to patients belonging to other weight bands (p=0.040). Sex, residence, type of TB and HIV status of the patient were not significantly associated with treatment outcome.

Discussion

In the present study it was observed that out of the total 110 patients, 76.4 % of patients were in age group of 11-40 yrs Similar study by Nair et al in Chennai showed that 70% were in the age group of 15-44 yrs.[4] The demographic profile of MDR-TB patients in our study was similar to other studies, with a majority of patients, 62(56.4 %), in the economically productive age group (26-55 years) with male patient predominance.[5,6] Our study participants included 88 (80.0%) males and 22 (20.0%) females. The mean age of the patient was 33.13 years. A study conducted in Uttar Pradesh also revealed that more than 2/3rd of patients were male and the mean age was 32 years.[7] Similar male preponderance was observed in the study by a study on MDR-TB patients in Cairo, Egypt and in Indonesia showing that out of the total, 72.9% and 68.6% were males respectively. [8,9]

Table 1 revealed the outcome of the total 110 patients, 36 (32.7%) were cured, 20 (18.2%) completed treatment, 16 (14.5%) patients defaulted, 22 (20.0%) died, in 11 patients (10.0%) regimen was changed or shifted to XDR TB regime and 5 (4.5%) patients were transferred out. In the present study, treatment success rate, which consist of cured and treatment completed was 50.9%. The result is consistent with reported global (52%) and national (56%) MDR-TB treatment success rates.[10,11]

MDR-TB treatment success rate recorded in a study conducted in patients from Chinese referral hospitals also showed similar success rate.[12] Another study done in china showed success rate of 57 %.[13] A study undertaken to analyze the clinical profile and treatment outcome in pulmonary drug tuberculosis (TB) patients under programmatic management of multidrug resistant tuberculosis (PMDT) at a tertiary care center in Mumbai showed 48.4% of MDR-TB patients were successfully treated (cured +treatment completed), 43.47% were cured, 10.1% completed treatment, 13.04% died, 1.4% failed, 15.4% defaulted, 4.3% stopped treatment due to adverse drug reactions and 11.5% transferred.[14] Another study in Karnataka showed that at the end of treatment, 44.2% were cured, 12 defaulted, 9 died, 1 failure and 2 were under XDR TB evaluation.[15] Studies in Portugal and China showed the treatment success of 62% and 68.3% respectively.[16,17]

Table 2 shows the clinic-demographic determinants of treatment outcome. Our study observed that favourable outcome was significantly higher among the age group of 11-25 yrs. 30 (69.8%) patients had favourable outcome. Unfavourable outcome was seen in 80.0% of patients of more than 55 yrs age. Studies by Dengkui et al in Shanghai, Nair et al in Chennai and Gafar et al in South Africa on predictors of treatment

outcome showed that unfavourable outcomes in MDR TB cases were significantly higher among cases >45 years.[18,4,19]

Favourable outcome was significantly higher among patients with weight band 46-70 kg i.e 36(62.1%) as compared to patients belonging to other weight bands (p=0.040). A study by Agarwalla, *et al* on outcome of MDR patients that majority of the patients in this study are of low BMI (<18.5 kg/m^2) and their success rate is significantly less compared to patients having BMI more than 18.5 kg/m^2.[20]

Other factors like sex, residence, type of family and HIV status did not affect the treatment outcome.

Conclusion

Treatment of MDR-TB is major challenge due to the prolonged regimens, multiple drugs used and high incidence of drug toxicities. This is, in turn, contributes to poor treatment adherence and further exponential magnification of drug resistance which can have devastating consequences. The treatment success rate (cured and treatment completed) in the present study was 50.9% which is similar to global treatment success rates of a 55%. Favourable treatment outcome was present in 50.9% cases. The predictors of unfavourable outcome were age ≥26 years and weight band of 26-45 under RNTCP

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Microbial Contamination of Tooth Paste Tube Orifice

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Abstract

Introduction: Tooth brushes are a vital component of routine oral hygiene aids used in promotion of oral health and prevention of oral diseases. Unfortunately, they are often stored in unsanitary conditions such as bathrooms. These unsanitary conditions are the settings that harbour millions of different pathogenic microbes.

Objective: To determine the microbial contamination of used toothpaste tube orifice.

Method: Sealed tooth brush and tooth paste tube were given to individual participants and to the families. Toothpaste tubes were collected from each family and from individuals after 30 days of usage. Microbiological samples were collected from the toothpaste orifice using sterile cotton swab. Organisms from swabs were cultured on selective media (nutrient agar) for the identification of certain groups of microorganisms. Colony Forming Units (CFU) was calculated using CFU counting unit. Gram staining was done to find out the nature and character of the organisms.

Results: A Clinical In-vitro study, the mean number of colony forming units was 246.6± 305.73 among single user and 709.5± 492.61 among multiple users as shown in Table 1. The distribution of microorganism CFU (Colony Forming Units) among single user and multiple users was found to be statistically significant (p=0.021).

Conclusion: In the present study, it was found that toothpaste tube can also be the possible source for potential pathogens that can compromise not only the health of the individual but also the individuals using the same toothpaste tube.

Keywords: *Micro organisms, Toothpaste, Toothbrush, Cross contamination*

Introduction

With the dawn of 21st century, dentistry has witnessed advances in the arena of diagnosis, treatment and prevention. Primary level of oral disease prevention has attracted many investigators to conduct clinical and field trials to provide effective prevention at this level. The increased awareness of the need for good dental health and the emphasis on preventive procedures by dentists and dental educators has made the role of a tooth brush and tooth increasingly important[1]. The neglect in the appropriate maintenance of tooth brushes is attributed to lack of public awareness on the possibilities of tooth brush contamination while they are stored after brushing.[2] The colonization of pathogenic micro-organisms on toothbrush while being stored in unsanitary conditions represents a potential cause of re-contamination of the oral cavity.[3] Tooth brushes can get contaminated with microorganisms which are present

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in oral cavity and from the environment. Retention and survival of microorganisms on tooth brush after brushing represents a possible cause of recontamination of mouth and other toothbrushes[4]

Numerous studies have shown that prolonged use of the tooth brush facilitates contamination by various microorganisms such as *Streptococcus*, *Staphylococcus, lactobacilli*, *Pseudomonas, Klebsiella*, *Escherichia coli* and *Candida*. These microorganisms are implicated to cause dental caries, gingivitis and stomatitis in an individual[2]. These bacteria are also found to be implicated in the causation of many life threatening diseases such as infective endocarditis besides influencing the occurrence of oral diseases such as dental caries and gingivitis[5].

Microbiological contamination of the oral cavity has long been a widely discussed topic and the subject of scientific publications; however, the same attention has not been given to the contamination of toothbrushes[6]. M. Svanberg[7] conducted a study to assess the contamination of toothpaste and toothbrush by *Streptococcus mutans* and found that fifteen minutes after brushing > lO^6 *S. mutans* were isolated from the toothbrushes and after ordinary storage for 24 h 10^4 were recovered. From two out of 10 toothpaste tubes *S. mutans* was isolated from the orifice of the tube.

Even though the use of the single toothbrush is mostly confined to one individual, the same toothpaste tube is generally used by several family members and hence there is a chance of spread of microorganism through the toothpaste tube. There is complete lack of evidence on contamination of toothpaste by microorganisms from toothbrush or by environment. There is increased need to determine the contamination of toothpaste tube orifice by multiple users and by individual users. Hence the Hypothesis of the study is that toothpaste tube orifice is free of microorganism.

Materials and Method

In the present Clinical In-vitro study, Subjects residing individually in hostel rooms who used personal toothpaste tubes and families consisting of minimum 3 people who shared a common tooth paste tube.Subjects who brush at least once daily using toothpaste and between the age group of 25-35 years. Toothpastes of participants that are kept inside the bathrooms with attached toilets were included.Subjects with history of antibiotics usage 3 months prior to the study, undergoing orthodontic treatment or with extensive intraoral prosthesis, any systemic diseases and undergone recent periodontal therapy were excluded. Ethical clearance was obtained from the Institutional Review Board. Sample Size was calculated to be 40 individuals who filled the inclusion and exclusion criteria were chosen and divided into Group I: Consisting of 20 individuals and Group II: Consisting of 20 families with minimum 3 members.

Method of collection of data:

Top brand of toothpaste which is commonly used by people was chosen as samples for the study. The average pack size of 200gms, packed in squeeze tubes manufactured within past 6 months was used in the study.

After obtaining the informed consent, a set of sealed tooth brush and tooth paste tube were given to individual participants and to the families, sealed single toothpaste tube and tooth brushes were given depending on number of members in the family. All the participants were instructed to use it for 30 days once daily. Toothpaste tubes were collected from each family and from individuals after 30 days of usage.

Study Procedure:

Microbiological samples were collected from the toothpaste orifice wearing gloves by using sterile cotton swab moistened with saline which were then kept in test tubes containing Robertson's Cooked Meat Broth. Organisms from swabs were cultured on selective media (nutrient agar) for the identification of certain groups of microorganisms. All the agar plates are incubated at 37^0c for 24 hours. Agar plates of single users were coded as SU (1-20) and multiple users were coded as MU (1-20).

After incubation, different patterns of colonies of microorganisms were identified by observing their colony morphology on all the agar plates. Colony Forming Units (CFU) was calculated using CFU counting unit. Gram staining was done to find out the nature and character of the organisms. Sub culturing of the required samples were done to isolate the microorganisms. Bio chemical tests such as Catalase test which will demonstrate the presence of catalase, an enzyme those catalyses the release of oxygen from hydrogen peroxide (H_2O_2). It is used to differentiate those bacteria that produce an enzyme catalase, such as *staphylococci*, from non-catalase producing bacteria such as *streptococci*. 3% H_2O_2 has been used for the routine culture. Citrate tests

are used to differentiate among the Gram-Negative bacilli in the family Enterobacteriaceae. Urease test is used as part of the identification of several genera and species of Enterobacteriaceae including *Proteus and Klebsiella.* Indole test is a commonly used biochemical test (e.g. in IMVIC test) which was done for 4 samples from each group. Indole test helps to differentiate **Enterobacteriaceae** and other genera.

Statistical Analysis

The data obtained was coded and fed into the SPSS (Statistical Package for Social Sciences) version 17 for analysis. All statistical tests were performed at 95% confidence interval. A p value less than 0.05 was considered as statistically significant.

Table 1: Distribution of microorganism CFU among single user and multiple users

Groups	Mean	Std. Deviation	t value	Significance
SU	246.60	305.73	2.525	0.021 S
MU	709.50	492.61		

<0.05, S – Significant

Table 2: Distribution of microorganism based on gram staining among single user and multiple users

Gram staining	Groups		Total	
	SU	MU		
+ve	12 60.0%	14 70.0%	26 65.0%	$\chi 2 = 0.220$ p = 0.639 NS
-ve	8 40.0%	6 30.0%	14 35.0%	

Table 3: Distribution of microorganism strains among single user and multiple users

Microorganism strains	Groups		Total	
	SU	MU		
Staphylococcus species	14 70.0%	12 60.0%	26 65.0%	χ^2 **= 5.077** **= 0.279** **NS**
Klebsiella species	4 20.0%	0 .0%	4 10.0%	
Streptococcus species	0 .0%	2 10.0%	2 5.0%	
Neisseria species	0 .0%	4 20.0%	4 10.0%	
Escherichia coli species	2 10.0%	2 10.0%	4 10.0%	

The mean number of colony forming units was 246.6± 305.73 among single user and 709.5± 492.61 among multiple users as shown in Table 1. Table 2 shows the distribution of microorganism based on gram staining among single user and multiple users. Table 3 shows the distribution of microorganism strains among single and multiple users.

Discussion

Contaminated tooth brush and tooth paste tubes have been characterized as a means of microbial transport, retention and growth. It can be the cause of reinfection of a person with pathogenic bacteria or can be the reservoir for environmental microorganisms.[6,7] Toothbrushes can become contaminated through contact with the environment and bacterial survival is affected by toothbrush storage containers. ***Dayoub et al***.[8] found that toothbrushes placed in closed containers and exposure to contaminated surfaces yielded higher bacterial counts than those left open to air.

The mean numbers of colony forming units were 246.6± 305.73 among single user and 709.5± 492.61 among multiple user samples. These results are in accordance with the study conducted by ***M. Svanber7***[3] conducted among 10 individuals, which showed that on the toothbrushes *S. mutans* represented 1.5 and 6.0 X 10^ CFU 15 min after the cleaning of the teeth. The results are also in accordance with the study conducted by **Lais Kuhn Rodrigues et.al**[9], wherein 91% of the toothbrushes had some type of microbial growth on them.

In the present study, distribution of microorganism based on gram staining showed that 26 (65%) were gram positive and 14 (35%) were gram negative organisms. In the study conducted by ***Snezana Pesevska et.al***[10], there was a high contamination of the used toothbrushes at 100% of the analyzed samples, with a domination of coliform bacilli. The results of the present study showed that both single user and multiple user toothpaste tube orifices were contaminated by different microorganism species such as *Staphylococcus, Klebsiella, Streptococcus, Neisseria and Escherichia coli.* These results are in accordance with the study conducted by ***Jagadeeshwar Rao Sukhabogii***[2]**,** in which *Pseudomonas, Candida, Streptococcus pyogens, Klebsiella, Staphylococcus aureus, Lactobacillus, Proteus and E.coli* was demonstrable in the tooth brush samples preserved in bathrooms with attached toilets. ***Bello et al***[11] reported *Staphylococcus, Escherichia,* and *Pseudomonas* in used toothbrushes; while ***Contreras et al***[12] reported that the most frequent microorganisms found in toothbrushes used by parents and children for one month were *Enterobacteriaceae* and *Pseudomonadaceae*. ***Kozai et al***[13] also reported that *Streptococcus mutans* and pathogenic microorganisms can be transferred readily when a toothbrush is used, increasing the risk of dental caries and infectious diseases.

In the present study, distribution of microorganism strains among single and multiple users are presented in the table, the organisms identified are in accordance with the study results of **Onuorah Samuel et.al**[14] in which *Staphylococcus aureus* was isolated from 60% of the samples while *Pseudomonas aeruginosa, Staphylococcus epidermidis, Streptococcus mutans, Escherichia coli* and *Enterobacter aerogenes* was isolated from 50%, 45%, 25%, 20% and 10% of the samples.

In the present study two freshly sealed packs were checked before the start of the study which did not show any colony formation. This is in contrast with the study conducted by **Efstratiou M et.al**[15]**,** in which multiplication of flora on usage at regular intervals and at different phase of time during the life of tooth paste pack was analysed and the results showed that aerobic spores were identified on day 1, where in it was company sealed pack and was opened under sterile conditions in a laboratory to dispense the sample for testing before any use.

Staphylococcus species was detected in 65% of the used toothpaste tubes examined, while *Staphylococci* are usually common skin inhabitants. *Enterobacter species* were also found in 10% of the samples. *Escherichia coli* are coliforms and members of the family Enterobacteriaceae. They are also pathogenic to humans in significant numbers. The presence of *Escherichia coli* on the toothbrushes examined was indicative of fecal contamination. *Streptococci species* were found to be 5% in the present study and these are aetiological agents of tooth decay and are important bacteria found on the teeth, buccal cavity and throat.

In the present study biochemical tests are used for identification of organisms. According to ***Holt et al***[16], the morphological and biochemical method of identification of bacteria is the classical method of characterization of bacteria. Classical identification of individual bacterial

species in environmental samples typically involves isolation, laboratory culture and then taxonomic characterization. But, biochemical tests have certain drawbacks such as less accurate, less discriminatory, phenotype may be unstable, induceable (i.e. influenced by gene expression) and subjective interpretation (less reproducible)[16]. Considering the available techniques for identifying LAB isolates, the advanced technique such as 16S rDNA sequencing and species specific PCR reactions might give more specific results.

Different brands of toothpastes are marketed to the public every year. There is a little research and information on their contamination by bacteria with use. In the field of Public Health Dentistry, it is important to understand that even though use of tooth brush is confined to each individual, toothpaste tubes are shared between multiple people especially among family members. The use of uncontaminated toothpaste will assist in the maintenance of sound oral hygiene and reduce the health risk posed by the contaminating bacteria to humans. It is recommended to use individualized toothpaste tubes like the individualized toothbrushes.

Conclusion

In the present study, it was found that toothpaste tube can also be the possible source for potential pathogens that can compromise not only the health of the individual but also the individuals using the same toothpaste tube. As toothbrushes, Toothpaste tubes may also have an important role in transferring microorganisms and increasing the risk of infection, because they can be a reservoir of microorganisms in healthy individuals, in those with oral diseases, as well as in those with impaired general health.

Since Public Health Dentistry underlines the prevention and control of infection, it is very important that they create an awareness about the issue of choosing, keeping and maintaining the hygiene of the toothbrushes and toothpaste tubes, as well as their replacement in an optimal time intervals in healthy population and especially in individuals affected with oral or systemic diseases.

Conflict of Interest – No

Source of Funding- No

Ethical Clearance – Taken

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Effectiveness Bearing Down Techniques During Second Stage of Labour on Maternal and Neonatal Outcome among Primigravida Mothers

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Abstract

Background: Maternal bearing down efforts plays a vital role in expulsive phase of labor. Various types of bearing down efforts has got its own advantages and disadvantages on mother and fetus. Various studies are done to evaluate the best bearing down techniques and have different results .The investigator personally felt there is a need to investigate the best bearing down technique with less complications to the mother and newborn **Objective:** 1.To assess the effect of vulsalva bearing down technique during second stage of labour on maternal and neonatal outcome among primigravida mothers admitted in selected hospitals of pune city. 2.To assess the effect of spontaneous bearing down technique during second stage of labour on maternal and neonatal outcome among primigravida mothers admitted in selected hospitals of pune city.3.To compare the effectiveness of vulsalva bearing down techniques and spontaneous techniques and duration of second stage of labour on maternal and neonatal outcome among primigravida mothers admitted in selected hospitals of pune city **Methodology:** In the present study, Quantitative research approach is applied and approach is applied and pre experimental ,Post test only control group design is used. The setting of the study was selected hospital of Pune. The sample size for study was 60, selected by using Non Probability Purposive Sampling Technique. The structured questionnaire and observation checklist was administered. In order to establish the reliability of the tool inter rater method was used. The scores were calculated and the reliability was established by Kappa method, which was 0.90. **Results:** On Comparison of the Spontaneous and vulsulva bearing down techniques on various maternal and neonatal outcome. Since the P values corresponding to the Maternal outcome, oxytocin given, Perineal laceration ,Type of episiotomy, size of episiotomy ,mode of delivery and fatigue and Neonatal outcome Crown heel length of newborn ,Head circumference of newborn, Neonate Resuscitation, Admission to NICU,APGAR score are small (less than 0.005) suggests that vulsulva bearing down technique is significantly different that spontaneous bearing down technique in the above maternal and neonatal outcomes and good result for the health of mother and newborn **Conclusion:** The Spontaneous pushing method has a negative effect on various factors related to maternal and neonatal outcome factors according to the results in this study. Vulsalva pushing has various benefits towards the better health of Mother and Newborn so it should be accepted as best clinical practice.

Keywords: *Effectiveness, Vulsalva Bearing Down , Spontaneous Bearing Down Techniques ,Second Stage of Labour Neonatal outcome , Maternal outcome*

Introduction or back ground

Labor is a physiological process which is normal, which takes place with the expulsion of the fetus out from maternal uterus into the outside world. Labor is divided into three stages. The most challenging stage is the second stage .This stage refers to the passage of the baby through the birth canal until delivery(6). The second stage begins when the cervix has fully dilated and voluntary pushing is initiated. Several times this stage is also referred to as the "pushing" stage . During the second stage, maternal bearing down efforts aid in fetal descent as the fetus completes the cardinal movements of labor, rotating and descending through the maternal pelvis Maternal bearing-down efforts and their effect on the mother and the fetus have been studied and debated for decades. Maternal bearing down efforts plays a

vital role in expulsive phase of labor. Various types of bearing down efforts has got its own advantages and disadvantages on mother and fetus. Mothers who are in 2nd stage of labor must have a knowledge regarding maternal bearing down efforts when and how to push because if she bear down in 1st stage it may slow down the FHR during pushing and it should come to normal once the contraction is over and Even comfortable position during pushing also plays an important role in 2nd stage of labor .

The investigator has observed primigravida mothers suffer from complications during 2nd stage of labour because of the following reasons like lack of knowledge and practice about when to bear down, how to bear in 2nd stage and associated complication on both mother and fetus. The researcher referred various research data conducted data and find that In the present situation mothers are encountering many problems during the time of intra natal period Specially during second stage of labour. One of the major problems is management of maternal bearing down efforts. The investigator personally felt there is a need to investigate the best bearing down technique with less complications to the mother and newborn and increase the knowledge of the mothers regarding maternal bearing down efforts.

Material and Method

A Pre-experimental study design with quantitative approach was used, as this study was aimed, the approach was found to be most appropriate. A post test only control group research design was adopted for the present study. This study was conducted in selected hospital of Pune city. The selection was based on easy geographical accessibility, cooperation and availability of samples. Total 60 Primigravida mothers from Yashwantrao RaoChavan Memorial Hospital Pimpri Chinchawad ,Pune city who met the inclusion criteria were selected. Tool used for the collection of data was a observational checklist and structured questionnaire. **Findings: The** analysis and interpretation of the data collected to determine the Effectiveness of bearing down techniques is carried out based on objectives set by the researcher taking the level of significance as 0.05

Table 1: Effect of vulsalva bearing down technique during second stage of labour on maternal outcome among primgravida mothers admitted in selected hospitals N=60,n30

Maternal outcome Frequency ercentage (%)			**Vulsulva Bearing Down technique**	
1	No of contraptions in late 30 min of second stage	10-20 contractions	3	10.00%
		30-40 contractions	6	20.00%
		20-30 contractions	7	23.30%
		40-50 contractions	14	46.70%
2	Oxytocin given	75-90 Drops	26	86.70%
		91-100 Drops	4	13.30%
3	Fatigue	Mild - 1- 3	25	83.30%
		Extreme 7-9	4	13.30%
		Moderate- 4-6	0	0.00%
		Worst Fatigue -10	1	3.30%
4	Perineal Laceration	IST Degree	3	10.00%
		IInd Degree	1	3.30%
		IIIrd Degree	1	3.30%
		No laceration	25	83.30%

Cont... **Table 1: Effect of vulsalva bearing down technique during second stage of labour on maternal outcome among primgravida mothers admitted in selected hospitals N=60,n30**

5	Types of episiotomy	Medio-Lateral	14	46.70%
		Median	0	0.00%
		Not given	16	53.30%
6	Size of episiotomy	-	16	53.30%
		2-3 cm	8	26.70%
		1-2 cm	4	13.30%
		3-5 cm	2	6.70%
		5-7cm	0	0.00%
7	Mode of Delivery	Normal vaginal delivery	17	56.70%
		Normal vaginal delivery with episiotomy	13	43.30%

Table 2: Effect of vulsalva bearing down technique during second stage of labour on neonatal outcome among prim gravida mothers admitted in selected hospitals N= 60,n30

Neonatal outcome Frequency ercentage (%)			**Vulsalva bearing down technique**	
1	APGAR score	No depression	15	50.00%
		Mild depression	11	36.70%
		Moderate depression	4	13.30%
2	Weight of New-born	2.5 kg	24	80.00%
		2.5 to 3.1 kg	6	20.00%
3	Temperature of new born (axillary)	96.8 F	27	90.00%
		96.8 - 97.70 F	2	6.70%
		<96.8 F	1	3.30%
4	Crown -heel length of New-born	50 cm	24	80.00%
		<50 cm	4	13.30%
		50 to 52 cm	2	6.70%
5	Head Circumference of New-born	35 cm	26	86.70%
		33 to 35 cm	2	6.70%
		<35 cm	2	6.70%
6	Neonate Resuscitation:	Only suctioning done	26	86.70%
		Only bag and mask ventilation given	1	3.30%
		Bag mask ventilation with stimulation	3	10.00%
7	Admission to NICU:	< 24 hours	0	0.00%
		>24 hours	1	3.30%
		24 hours	3	10.00%
		Not required	26	86.70%

Table 3: Effect of spontaneous bearing down technique during second stage of labour on maternal outcome among primigravida mothers admitted in selected hospitals N=60,n=30

Maternal outcome Frequency ercentage (%)			**Spontaneous bearing down technique**	
1	No of contraptions in late 30 min of second stage	10-20 contractions	5	16.70%
		30-40 contractions	8	26.70%
		20-30 contractions	7	23.30%
		40-50 contractions	10	33.30%
2	Oxytocin given	75-90 Drops	16	53.30%
		91-100 Drops	14	46.70%
3	Fatigue	Mild - 1- 3	20	66.70%
		Extreme 7-9	9	30.00%
		Moderate- 4-6	1	3.30%
		Worst Fatigue -10	0	0.00%
4	Perineal Laceration	IST Degree	19	63.30%
		IInd Degree	3	10.00%
		IIIrd Degree	0	0.00%
		No laceration	8	26.70%
5	Types of episiotomy	Medio-Lateral	27	90.00%
		Median	1	3.30%
		Not given	2	6.70%
6	Size of episiotomy	-	2	6.70%
		2-3 cm	6	20.00%
		1-2 cm	2	6.70%
		3-5 cm	15	50.00%
		5-7cm	5	16.70%
7	Mode of Delivery	Normal vaginal delivery	2	6.70%
		Normal vaginal delivery with episiotomy	28	93.30%

Table 4: Effect of spontaneous bearing down technique during second stage of labour on neonatal outcome among primigravida mothers admitted in selected hospitals N=60,n=30

Neonatal outcome Frequency ercentage (%)			Spontaneous bearing down technique	
1	APGAR score	No depression	15	50.00%
		Mild depression	12	40.00%
		Moderate depression	3	10.00%
2	Weight of New-born	2.5 kg	21	70.00%
		2.5 to 3.1 kg	9	30.00%
3	Temperature of new born (axillary)	96.8 F	27	90.00%
		96.8 - 97.70 F	3	10.00%
		<96.8 F	0	0.00%
4	Crown -heel length of New-born	50 cm	20	66.70%
		<50 cm	0	0.00%
		50 to 52 cm	10	33.30%
5	Head Circumference of New-born	35 cm	19	63.30%
		33 to 35 cm		0.00%
		<35 cm	11	36.70%
6	Neonate Resuscitation:	Only suctioning done	21	70.00%
		Only bag and mask ventilation given	8	26.70%
		Bag mask ventilation with stimulation	1	3.30%
7	Admission to NICU:	< 24 hours	7	23.30%
		>24 hours	12	40.00%
		24 hours	0	0.00%
		Not required	11	36.70%

Discussion

In this study analysis, there was comparison on various components of maternal and neonatal outcome first The APGAR Score recorded of the newborns in Vulsulva Bearing Down Techniques have good score as compare to Spontaneous Bearing Down Technique A study suggesting that prolonged second stage of labour is associated with low apgar was refred to compare the result , Second stage of labor was Prolonged and it was reported which were associated with an increased risk of low 5 min APGAR score for neonates of nulliparous women in a Swedish study from research group(1). Trauma is an important factor to consider when assessing overall efficacy of vulsulva bearing down technique .Tears are a measurable outcome, since they can be categorized in terms of intact perineum, first, second or third degree tears and episiotomy (2) . Retrospectively requested information about perineal damage in 39 primiparous women who had had spontaneous vaginal births. Similarly in this study the record of perinieal laceration in less when compared with the spontaneous bearing down techniques

Conclusion

Vulsulva pushing during in second-stage labour is a safe and less exhausting pushing technique, it was not associated with demonstrable adverse outcome .it is significantly, decrease incidence of perineal laceration. Also it has good outcome in regard to maternal fatigue and neonatal Apgar score and reduces the chances of neonatal resuscitation and fetal injury when compared to Spontaneous pushing during the second stage of labour.

Conflict of Interest – Nil

Source of Funding- Self

Ethical Clearance – Obtained from Institute and Hospital

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Denture Identification Methods: A Review

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Abstract

Denture marking is accepted as a means of identifying dentures and persons in geriatric institutions, during war, crimes, and civil unrest, natural and mass disasters, post mortem and medico-legal investigations. This review highlighted the various methods of denture marking and significance of placing identification marks on dentures.

Key words:- *Denture marking, Geriatric, Identification*

Introduction

Denture marking is accepted as a means of identifying dentures and persons in geriatric institutions, or post-mortem during war, crimes, civil unrest, natural and mass disasters. Due to the lack of a comprehensive fingerprint database, dental identification is growing as an essential part of forensic investigation. Prosthodontists are playing very important role in forensic dentistry as they are concerned with fabrication of various prostheses which can serve as an important tool for identification. The denture marking is important for the following reasons:[1]

a. It serves to identify an unknown denture wearer in cases involving amnesia or senility, loss of memory, psychiatric cases, homicide, suicide, victims of fire, explosion, floods, earthquake, plane crash, or war.

b. In cases of lost and found, the denture can be returned to the owner.

c. A rapid and accurate method other than finger printing is essential for identification of the individuals.

d. In the laboratory, the dental technicians will find it easy to identify a denture, especially at the deflasking stage, if it is marked / labeled.

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e. To ensure the correct denture delivery to the respective patient.

Medicolegal Importance of Denture Marking Systems[2]

1. Identification of the dead or deceased when all other means have failed.

2. Identification of individuals for forensic, social and legal reasons.

3. Victim identification in case of mass disasters like terrorism, bombings, earthquakes, hurricanes, typhoons, air crashes and other transportation mishaps.

4. Identification of mutilated and decomposed bodies when all other parameters like scars, tattoos, and facial features have failed.

Methods of denture identification

Various methods of denture marking have been reported in the literature. However, there are two main methods in marking dentures, namely the surface method and the inclusion method. As compared to surface methods, inclusions methods are permanent but require more skills and are time consuming.[3]

Surface Methods

Scribing or engraving method

In this method letters or numbers are engraved on the denture surface with the help of a small round dental bur.[4]

Disadvantage: Food entrapment occurs in the engraved grooves.

Embossing method

In this technique name and other particulars of the patient are scratched on the master cast. After processing it produces stamped or embossed letters on the impression surface of dentures.[5]

Disadvantage: This technique has been associated with malignancy, possibly due to continued tissue irritation.

Invisible Ink Method

Harvey described a method wherein the patient's details are written with an invisible ink that is rendered visible by ultraviolet light. This is useful on acrylic resin dentures of those patients who object to normally visible identification marks.

Disadvantage: The mark is not readily visible and examination under special conditions is required to determine its presence.[6]

Fibre Tip Pen Method

atient's details are written on the tissue-fitting surface or the polished surface of the denture with a fibre-tip pen. The patient's identification details are then covered by at least two thin coats of varnish in order to prolong the life of the marking.[7]

Disadvantage: This method resulted in an unesthetic denture.

Denture Bar Coding Method

A bar code consists of a machine-readable code of a series of bars and spaces printed in defined ratios. The technique described for denture bar coding involves printing a number code on paper, photographing the paper, making and transferring the negative to a piece of silk. An image of the bar code appeared on a prepared faience, by a machine that forced the paint through the silk, when heated to 860 degree C for 30 min in an industrial porcelain oven. The bar code is directly placed onto the denture surface and cyanoacrylate resin is painted to conceal the marking.[8]

Disadvantage: Incorporating the bar code into the curved denture flange is relatively cumbersome due to rigidity of the laminated strip.

Lenticular card method

In this technique a lenticular lens is used to produce images with an illusion of depth, morph, or the ability to change or move as the image is viewed from different angles. Lenticular printing is a multi-step process consisting of creating a lenticular image from at least two or more existing images, and combining it with a lenticular lens. Each image is sliced into strips, which are then interlaced with one or more of the other images. These are printed on the back of a synthetic paper and laminated on the lens The most common materials used for making lenticular images are polyvinyl chloride (PVC), amorphous polyethylene terephthalate (APET), acrylic, spectra, and polyethylene terephthalate glycol (PETG). The lens is incorporated in the channel cut on the denture and auto-polymerizing clear acrylic resin is added around and not on the identifier.[9]

Paper Strip method

It utilizes onion skin paper. The acrylic resin fitting surface situated adjacent palatally between the ridge and the center of the palate is moistened with monomer on a small brush. The strip of typed paper is laid on this surface and the paper is moistened with the monomer. Clear resin is then placed over the paper before final closure of the denture flask.[10]

RFID Tags

RFID stands for radio-frequency identification, which is a wireless electronic communication technology. The radio-frequency identification (RFID) system consisted of a data carrier, or tag, and an electronic handheld reader that energizes the transponder by means of an electromagnetic field emitted via the reader's antenna. It then receives the coded signal returned by the transponder and converts it into readable data.[11]

Advantages

This method is a cosmetic, effective labeling method permitting rapid and reliable identification of the wearer.

b.) They are preferred because of their small size (8.5×2.2 mm).

c.) A large amount data can be stored in them.

d.) No special training is required to set the tag in the denture.

e.) The chip is resistant to disinfectants and solutions of 1% hypochlorite, 4% chlorhexidine, and 4% sodium perborate.

Photographic method

In this technique patient's photograph is embedded in the denture with the help of clear acrylic resin.

The name, age and geographic location of the patient are written on the obverse of the photograph using a micro-tip graphite pencil. The marker is particularly useful in the countries with low literacy rate where a photograph is the easiest method of identification.[12]

Advantage:

The identity is easily ascertained by lay persons with the unassisted eye.

Incorporation of Min. I. Dent

atient's details are typed on Min. I. Dent denture identification strip and the strip is heated in an oven at 325 degree C for 30 s to 1 min. This allows shrinkage of lettering or numbers and the strip becomes a chip. The chip is trimmed to required size using carbide bur. A groove is cut into the denture and the chip is incorporated into the groove and sealed with orthodontic resin.[13]

Lead Foil

A piece of lead foil from a used IOPA radiographic film is cut and patient's details are engraved with a sharp pointed pen or instrument and is embedded in the denture with the help of clear acrylic resin.[14]

Advantage

This technique is easy to operate. b.) It is economical. c.) It is radiographically visible.

Ceramic Crown Engraving Method

After baking the opaque layer of porcelain, dentin porcelain is applied and initials of name of the patient or letters are carved with the brush. Stains are applied on carved initials followed by enamel porcelain application shaped with soft brush so that the initials are maintained. Few initials can be carved in crown and bridges due to lack of available space.[15]

Conclusion

Denture marking should be compulsorily carried out for hospitalized patients, unconscious patients and patients in geriatric institutions. There is a strong need to adopt an international policy for denture marking and international collaboration should be encouraged, with different opinions from the world-wide community of forensic odontologists discussed and with the aim of reaching some kind of consensus for the future.

Conflicts of Interest: The authors declare that there is no conflict of interest regarding the publication of this paper.

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Maternal Tobacco Use and Risk for Congenital Anomalies

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Abstract

Over a period of decades non genetic causes are controlled and mortality and morbidity is considerable reduced due to malformation[5,6]. Although 50% of causes for malformation are unknown Origen, but, with primary prevention 50% of birth defects could be prevented. Research for finding the risk factors are continuous and such results would help to implement preventive strategies to improve maternal and child health.

Methodology: This is cross sectional; hospital based study, conducted in Krishna Hospital Karad, included all the Pregnant Mother diagnosed to have congenital birth defected fetus through antenatal examinations, delivered baby with diagnoses of congenital malformation, who were admitted at Tertiary care hospital Karad.

Results: Total 283 cases were diagnosed with birth defects. Parent's history for tobacco use states that16 (5.7%) mothers and 149 (53%) of fathers of malformed babies used tobacco. Among these 16 (5%) tobacco user mothers, maximum babies 5 (1.7 %) babies had born with neural tube defect and among fathers 149 (53%) maximum babies 41 (14%) Circulatory System defect.

Conclusion: There is a need to make the rural women aware about hazardous effects of use of mishri[20] through health education sessions to wean them out of this addiction, which is passed from one generation to the next as a tradition at an early age.

Key words*: Maternal, risk factors, Tobacco Use, Congenital Anomalies*

Introduction

According to WHO, Nearly six million people die due to tobacco use per year in that five million deaths are the result of direct tobacco use and more than 600,000 are the result of non-smokers being exposed to second-hand smoke[1]. In India, as per Global Adult Tobacco Survey India (GATS) estimated number of tobacco users being 274.9 million where 163.7 million users of only smokeless tobacco, 68.9 million only smokers and 42.3 million users of both smoking and smokeless tobacco). It means around 35% of adults (47.9% males and 20.3% females) in India use tobacco in some form or the other. Use of smokeless tobacco is more prevalent in India (21%).[2] adverse effect of tobacco on human physiology is well documented. The effect of tobacco on growing fetus when pregnant mother is exposed to tobacco is matter of concern as it effect fetus in various ways and also leading cause for congenital malformations. This is true for the passive or second hand exposure to tobacco also.

Many etiological factors contribute for the malformation and these are either genetic or non-genetic (environmental) and some time combined. Non genetic causes are exposure to any teratogenic substance or toxic including harmful drugs, organic chemicals, nutritional deficiencies and radiations. The exact relation between birth defect and tobacco use is not clearly understood, although hypotheses states that nicotine has direct effect on blood vessel. Nicotine causes Vasoconstriction which

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leads to decreased blood supply to placenta is major reason for birth defect[3]. Other reason may be, carbon monoxide combines with hemoglobin and reduces the placental oxygen availability. Another reason of tobacco use is, it increases the repture of capillaries from neovasculirisation of placenta leading to hypoxia to the fetus which results in abnormal fetal morphogenesis[4].

Over a period of decades non genetic causes are controlled and mortality and morbidity is considerable reduced due to malformation[5,6]. Although 50% of causes for malformation are unknown Origen, but, with primary prevention 50% of birth defects could be prevented. Research for finding the risk factors are continuous and such results would help to implement preventive strategies to improve maternal and child health.

Methodology

resent descriptive, cross sectional; hospital based study was conducted in Krishna Hospital Karad, which provides specialist's tertiary care services to patients largely belonging to lower/middle socio-economic strata of the society with both rural and urban background. The study included all the Pregnant Mother diagnosed to have congenital birth defected fetus through antenatal examinations, delivered baby with diagnoses of congenital malformation, who were admitted at Tertiary care hospital Karad or came for reference services between September 2016 to august 2017. The study was initiated after approval of the Institutional Ethics Committee of Krishna Institute of Medical Sciences Deemed University's. Maternal and paternal data was collected to evaluate the relation between parental tobacco use and congenital malformations.

Results

Prevalence of congenital malformation

Data was collected from Pediatric and Maternity unit. Total Babies 75136 visited to pediatric outpatient department, 4092 kids admitted at pediatric ward and 774 neonates identified in Neonatal Intensive Care Unit as congenital malformations. Prevalence is being maximum in the Neonatal Intensive Care Unit 41 (5.3%), followed by Pediatric Ward 14 (0.3%) and pediatric Outpatient Department 45 (1%). 50856 patients were visited to Maternity Outpatient Department in that 131 patients had the diagnosis of having congenital malformation fetus contributing to 0.3% of prevalence. Whereas maternity ward had 3847 admission among those 52 (1.4%) had delivered congenital malformed babies. Total 283 cases were diagnosed with birth defects.

Table no: 01: Prevalence of tobacco use among Mothers of malformed babies

Used Of Tobacco	Maternal	
	Frequency F	Percentage %
No	267	94.3 %
Yes	16	5.7 %
Total	283	100%

Total 283 malformation cases were identified. Parent's history for tobacco use states that16 (5.7%) mothers and 149 (53%) of fathers of malformed babies used tobacco.

2. System wise distribution of congenital malformation

Distribution of congenital malformation according to International Classification of Disease (ICD – 10) carries out after collecting data which shows, maximum Congenital malformations of nervous system 63(22%), followed by circulatory system 57 (20%) and deformations of the musculoskeletal system 47 (17%). Other deformities includes Cleft lip and cleft palate 29 (10%), malformations of the digestive system 23 (8%), malformations of genital organs 19 (7%), malformations of the urinary system 21 (7%), other congenital malformations 2 (1%), Chromosomal abnormalities, not elsewhere classified 15 (5%) malformations of the respiratory system 5 (2%) and Congenital malformations of eye, ear, face and neck 2 (1%).

Number of Congenital Malformation with Use of tobacco

Table no: 02: System wise classification of Congenital Malformation according to tobacco use

ICD CODE	System Of Congenital Malformation	Maternal tobacco use				Total malformations
		No	%	Yes	%	
Q00-Q07	Nervous System	58	20.5	5	1.8	63
Q10-Q18	Eye, Ear, Face And Neck	2	0.7	0	0.0	2
Q20-Q28	Circulatory System	54	19.1	3	1.1	57
Q30-Q34	Respiratory System	5	1.8	0	0.0	5
Q35-Q37	Cleft Lip And Cleft Palate	29	10.2	0	0.0	29
Q38-Q45	Digestive System	22	7.8	1	0.4	23
Q50-Q56	Genital Organs	19	6.7	0	0.0	19
Q60-Q64	Urinary System	21	7.4	0	0.0	21
Q65-Q79	Musculoskeletal System	44	15.5	3	1.1	47
Q80-Q89	Other Congenital Malformations	2	0.7	0	0.0	2
Q90-Q99	Chromosomal Abnormalities	11	3.9	4	1.4	15
Total		267	94.3	16	5.7	283

The above table explains congenital malformation and history of Use of tobacco. 267(94%) mothers stated no history of using tobacco and only 16 (6%) mother's found using tobacco during and before their pregnancy. Among these 16 (5%) tobacco user mothers, 5 (1.7 %) babies had born with neural tube defect, 3 (1%) babies with Circulatory System and Musculoskeletal System defects and 1(0.3%) with digestive deformities.

As per fathers' tobacco use concern, 149 (53%) fathers of malformed babies gave history of tobacco use. Among tobacco user, maximum babies 41 (14%) Circulatory System defect, 25 (10%) Musculoskeletal System, 24 (9%) nervous system malformations, 14 (5%) Urinary System, 12 (4%) Cleft Lip and Cleft Palate and Chromosomal Abnormalities, 11 (3.9%) Genital Organs, 9 (3%) Digestive System and only 1 baby diagnosed with respiratory defect.

Discussion

In our study 283 congenital malformation were identifies. Among these, 267(94%) mothers stated no history of using tobacco and only 16 (6%) mother's found using tobacco during and before their pregnancy. This pattern indicates that very few (6%) mother were at risk due to tobacco use. Malformations other than tobacco use are major risk in our study, but, the babies born to tobacco used mother must not be neglected in concluding the effect of tobacco on birth defect.

In India, per capita smokeless tobacco consumption has increased among the poor population between 1961 and 2000 in both rural and urban areas and both in males and females[7]. In India, the use of smokeless tobacco is common in various forms like chewed, sucked or applied to teeth and gums [8]. Maximum samples responded that they use chewable or applied form of tobacco. These kinds of smokeless tobacco products contain large amount of sodium (sodium bicarbonate) which is necessary to facilitate nicotine absorption[9]. The effect of sodium bicarbonate is not well understood but the effect of nicotine on malformation is well documented. Parents also reported that they use the powdered form of tobacco called a 'MISHRI', prepared by roasting tobacco leaves, and principal constituent being alkaloid nicotine in 1 to 7%[10]. The prevalence of tobacco use in this region is 17 – 45%[10].

Despite these methodological differences, the association of tobacco use during pregnancy and malformation is well cited by many authors such as Bird TM[11], Bracken MB[12], Cedergren MI[13], Christensen K[14], De Roo LA[15], Dickinson KC[16], Feldkamp ML[17], Ramirez D[18], and Williams LJ[19]. The results of these research were similar in regards to the association

between maternal smoking during pregnancy and defects of the cardiovascular, respiratory, digestive, nervous, Urogenital and musculoskeletal systems.

Conflict of Interest – NO Conflict of interest

Source of Funding- NO Self or other source

Conclusion

There is a need to make the rural women aware about hazardous effects of use of mishri[20] through health education sessions to wean them out of this addiction, which is passed from one generation to the next as a tradition at an early age.

Ethical Clearance: The study was initiated after approval of the Institutional Ethics Committee of Krishna Institute of Medical Sciences Deemed University's.

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Repair of Cast Partial Denture Made Easy– An Alternative Approach

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Abstract

Patients wearing cast partial denture might face breakage of denture due to any reasons. The ideal approach for repair of broken cast partial is electrosoldering. This paper presents an alternative approach for repair of cast partial denture using heat cure acrylic resin.

Key words: *Repair of denture, Electrosoldering, Cast Partial Denture.*

Introduction

Despite careful planning and competent construction with materials of good quality occasional breakage and distortion of Cast Partial Denture is seen.

Breakage can be either of the acrylic, major or minor connectors, clasps or the tooth. Need for repair may arise due to careless handling by the patient, inadequate mouth preparation, poor construction, metal fatigue, loss of fit, careless handling in the laboratorary[1]. Ideally electro-soldering is used to repair cast partial denture which is a process of building up of a localized area with a filler metal or joining two or more metal components by heating them below their solidus temperature and filling the gap between them using a molten metal. [2,3]

This clinical report describes an alternative approach for repair of cast partial denture using heat cure acrylic resin.

Clinical Report

A 51-year-old male reported to the department of Prosthodontics with the chief complaint of broken maxillary cast partial denture. On examination, a fracture was observed on both ends of the longitudinal component (strap) of the major connector that was joining the anterior and posterior palatal strap (Fig.1). To repair this cast partial denture the ideal procedure was electro soldering, but an alternate approach was planned. This clinical report describes an alternate approach to repair the broken cast partial denture using heat cured acrylic resin.

Procedure

An impression of maxillary arch was made using alginate with the broken cast partial denture in place. After retrieving the impression, the cast partial denture was removed from the impression and impression poured in die stone. After the cast had set the fractured fragments of cast partial denture were approximated on the cast (Fig.2). Once approximated, mechanical grooves were made on both ends of the broken cast partial denture using a disc and a mandrel to enhance mechanical bonding between metal and acrylic resin (Fig.3). Wax up of the cast partial denture was completed and it was acrylized in usual manner (Fig.4). The final product was finished and polished to prevent affinity towards food debris (Fig.5). When seen through light the thickness of acrylic resin and the joint can be appreciated (Fig.6). The repaired cast partial denture was then placed intraorally and checked for the fit (Fig.7). Any difficulty in placement or any occlusal discrepancy was eliminated.

Advantages

1. Comparatively easy to repair
2. Less technique sensitive
3. Economical
4. No complicated equipment required

Disadvantages

1. Only major & minor connectors can be repaired

2. Can be bulky
3. Less thermal perception
4. Shrinkage can cause distortion
5. Less strength compared to metal
6. If not polished, then can cause irritation

Fig. 1 – Broken cast partial denture

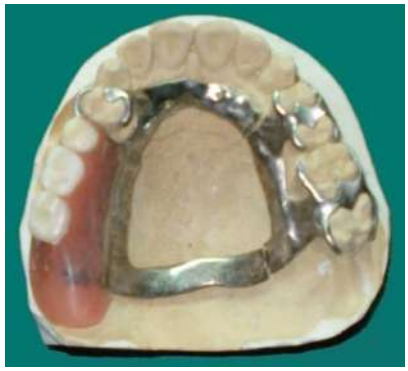

Fig. 2 – Broken Partial denture on cast

Fig. 3 – Mechanical grooves for retention

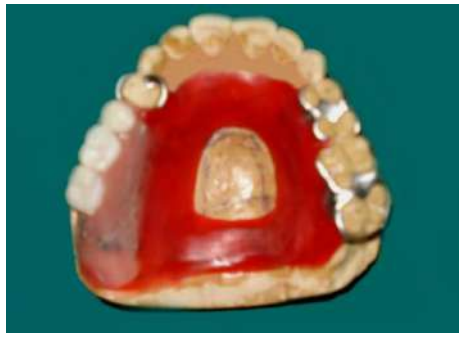

Fig. 4 – Wax up

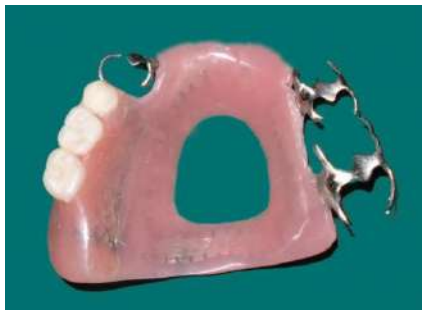

Fig. 5 – After acrylization

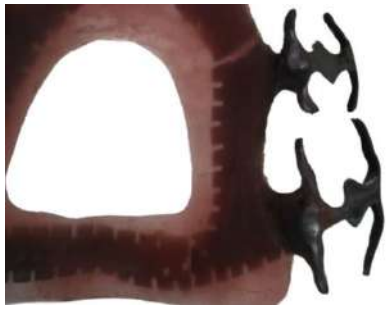

Fig. 6 – Through light

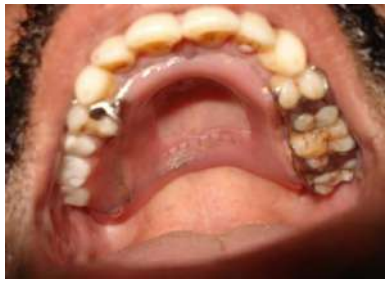

Fig. 7 – Intraoral Placement of Cast Partial

Discussion

Breakage of cast partial denture is very uncommon which can be a result of careless handling by the patient, inadequate mouth preparation, poor construction, metal fatigue, loss of fit, careless handling in the laboratory. Electro soldering is the process by which broken cast partial dentures are repaired which involves the process of building up of a localized area with a filler metal joining two or more metal components by heating them below their solidus temperature and filling the gap between them using a molten metal. Advantages of this technique includes adequate strength in thin sections, less bulky, non-irritating and light weight, whereas disadvantages include technique sensitivity and is expensive.

The technique described in this paper uses heat cured acrylic resin for the repair of broken cast partial denture. The advantages include less technique sensitivity hence easy to repair, economical and less complicated equipments are required. The disadvantages include bulkiness to the cast partial denture, shrinkage of heat cure resin can cause distortion, less strength than metal and if not polished well can cause irritation.

Conflict of Interest – None

Source of Funding – Self Funded

Ethical Clearance – Ethical clearance was not required hence so was not obtained

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Role of Demographic, Cognitive, Social Factors and Personality Trait on Treatment Modality Related Decision Making: A Conceptual Framework

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Abstract

Purpose: Understanding individual's treatment modality related preference and choice-behavior is prerequisite for equitable distribution of community medicine and Health Human Resource planning. Standard models emphasize on demographic determinants and need-based perception, loosely incorporating social affecters, cognitive components and personality trait. This study addresses these factors separately and integrates into a statistically valid model.

Methodology: Cross sectional study with sample size n=300 and 30 point questionnaire. Items are treated with exploratory factor analysis and regressed with preference and choice. Maximum likelihood estimates led to a path model.

Results: 40.3% prefer CAM and 51.3% used it in last 12 months. Male, people with higher education, low disease burden and making decision in-group, choose CAM and believe Conventional Medicine has side effect, CAM cures all disease, cheaper and usage along-with Conventional Medicine, is better. Extraversion has positive ($B=0.693, p<0.001$), Conscientiousness ($B=-.306, p<0.001$) has negative effect on CAM usage. The integrated model shows 12 months usage score has strong negative prediction to stated CAM preference, whereas cognitive component is strongest predictor of CAM preference and conscientiousness acts negatively on choice and preference. Disease burden acts as need factor and social effect as external influence over CAM preference.

Conclusion: Separately, demographic, cognitive, social factors, disease burden and personality traits influence treatment decision but the integrated path model shows factors act differently on preference and choice behaviour and also at different levels. This understanding will contribute to modify the existing conceptual models of healthcare utilization, facilitating the healthcare strategic planning and distribution system, related to health human resource management.

Keywords: *CAM, Human Resource for Health, Treatment Decision, Big 5 personality trait, Path analysis, Behavioral Choice Model*

Introduction

With the objective of 'leaving no one behind', the developmental policies of the United Nations aim at "universal access to good quality health care services, without anyone having to face financial hardship as a consequence" [1]. Towards materializing such equitable distribution of healthcare service, it has to be meaningful and more importantly acceptable, which largely depends upon understanding of people's healthcare preferences, including their treatment modality related preference, decision making process and choice behavior. The National Comprehensive Cancer Network Guideline states that even for end-of-life care, optimal management should incorporate psycho-social and spiritual aspects of not only the patients alone, but also of their family members and care givers as per their need, value, belief and culture (NCCN Palliative care guideline)[2]. Hence, a systematic research is of paramount importance to identify the significant aspects, influencers and factors

partaking treatment related decision making process at both macro and micro level.

Treatment modalities are broadly diverged into two categories; Conventional Medicine, based on principles of physics, chemistry and biology and Complementary and Alternative Medicine (CAM) in form of Ayurveda, Homeopathy, Chiropractic, Reiki, Acupuncture, Kampo, etc. Choosing whether to use Conventional Medicine or Complementary Medicine is a "Nonlinear Complex Dynamic procedure"[3].

Decision-making is defined as a cognitive process (Princeton University definition, 2006). During the treatment related decision making process patients seek information on treatment alternatives and want to be involved in treatment decisions [4], which is in turn highly intervened by the community, family members and their social values[5,6]. While choosing a treatment modality, studies show that an individual's choice may be affected by external factors like demographic, financial condition, peer pressure, treatment availability, culture, belief, habit[7] etc. or internal factors like personality trait, cognitive ability, philosophical congruence[8] etc. However, for conceptualization and prediction of individual's choice of treatment modality, these data need to be presented in a structured, systematic flow. Though, behavioural healthcare utilization models loosely describe the choice making process of treatment modality, doesn't validate it with quantization. Among the existing conceptual models of healthcare related decision making, the Andersen Healthcare Utilization Model has been widely accepted, (Anderson, 1995)[9] demonstrating three determinants- predisposing factors, enabling factors, and need. (Figure 1)

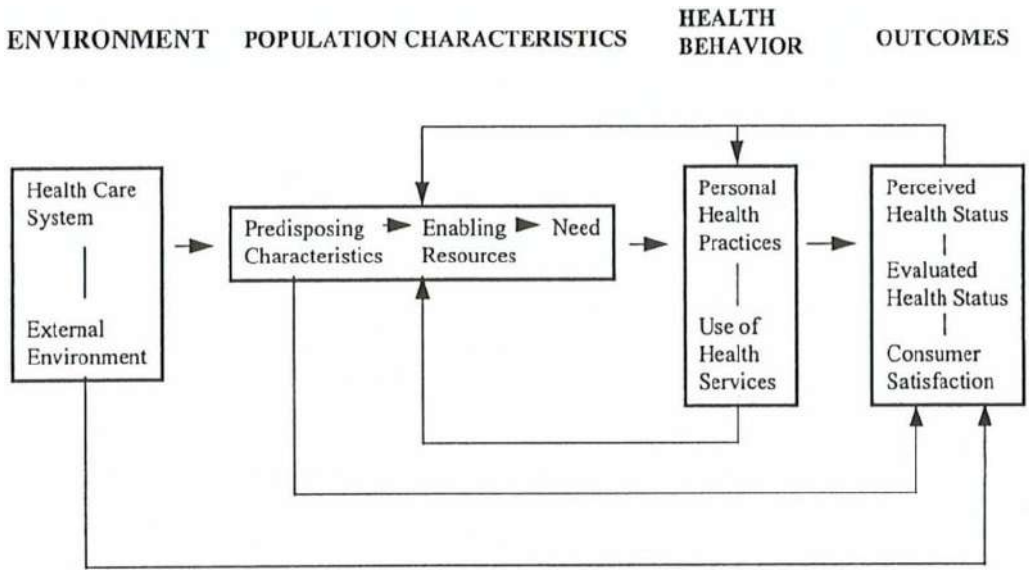

Figure 1. Andersen Healthcare Utilization Model (1995)

Another prominent model, i.e. Charles' Healthcare Decision model[10] shows Information exchange, Deliberation and Decision Control are the main determinants. Most healthcare utilization models emphasize on need based perception and demographic determinants, vaguely incorporating social affecters and cognitive components, with no reference of individual's personality trait. On the other hand, modern workers have emphasised on personality trait in all treatment related decision making (Flynn and Smith, 2007; Sorensen, 2008)[11,12]. Besides, as previously discussed, apart from need (perceived disease burden), philosophy and effect of previous choice behaviour in current preference would change the healthcare utilization pattern greatly.

Thus, a gap is observed in terms of integration of all treatment modality related decision making factors into a statistically validated model and measuring relative importance of each factor. From existing literatures, we have Social and community based decision modifiers along with cognitive, personality and need based factors acting as major contributors in decision function. In view of this, the study aims to identify the factors determining individual's preference and choice towards a particular treatment modality and separately addresses

each factor to understand their relative importance by factorising the external influencers and regressing the internal cognitive elements with the decision outcome. Further, this study also tries to integrate the identified factors into a statistically valid structure, by assimilating them through a path model, where some influencers have been observed not to play significant role while acting simultaneously with other variables.

Methodology

This cross sectional study includes responses from a pretested and pre-structured 30 point questionnaire from a sample of 300 responders distributed in the rural and urban setting of Kolkata and 25 km surroundings area, as collected from December'2016 to May'2017. Responders belong to age group of above 18; having basic idea of both Conventional Medicine and Complementary and Alternative Medicine. The questionnaire having 7 point Likert scale and dichotomous scale (yes/no) is sub-structured into demographic variables, disease burden, social, cognitive and personality trait items, which are later factorised. Results are analyzed using IBM SPSS ver.23. The questionnaire has been tested with a pilot study of 50 samples for reliability with Crohnbach alpha (>.7 for all subparts with Likert scale items) and validity with inter-correlation coefficients. The 7 point Likert scale value of CAM usage has been tested and shown to be similar to normal data (Shapiro Wilk test Normalcy= 0.908, p<0.001) and hence is taken into parametric analysis. Chi square test has been done on demographic variables determining their dependence on choice behaviour and preference. The responses of the disease burden items are transformed linearly to disease burden score. Factor analysis is done on items related to social, cognitive and personality trait effectors. For social and personality trait items, with factor scorings as independent variables, parametric regression analyses have been done taking CAM usage as dependent variable. Cognition being an all or none process is itemised with dichotomous scale. Items for different cognitive components are used as independent variable for binary logistic regression. From the significant variables, cognitive factor score has been calculated. From statistically significant regressive factors, likelihood estimates were done on prevalence and preference alongwith covariances and is plotted for path analysis through AMOS ver.20.The final model has been tested for fitness with validation methods.

Results

Demographic outcomes

121 responders (40.3%) prefer CAM at the point of study where 51.3% people have actually used in last twelve months, which, in this study has been considered as CAM prevalence. There is thus, a significant difference between preference and prevalence of choice behaviour over CAM related decision making (p=.007). With different demographic variables such preference and prevalence have been tested for dependence (chi square test for 2 X n contingency tables). Unlike the usage, preference pattern is independent of age. Male responders prefer (p=.001) and use (p=.026) CAM. People with higher education and higher socioeconomic status are using CAM (p=<0.001). Responders with higher disease burden of self and family tend to prefer conventional medicine (p=<0.001) and people taking decision in group prefer and choose CAM. Table 1 depicts the summary of the demographic outcomes.

Table 1: Significance of demographic variables in CAM spreference and prevalence

Proportinal comparison of CAM preference vs CAM prevalence		**Z= 2.70** ***P*= 0.0069**
Demographic Character	**CAM vs CONV preference (*P* value)**	**CAM vs CONV prevalence (*P* value)**
Age	0.546	0.005
Gender	0.001	0.026
Education level	0.055	<0.001
Socio-economic status	0.925	0.017
Desease Burden	<0.001	0.043
Decision in group	0.001	<0.001

The Personality Factor

Exploratory factor analysis extricated three underlying factors as per big five personality trait model; neuroticism, extraversion and conscientiousness. After rotation, cumulative sum of squared loading on three factors came to be 64.23%, i.e. well explanatory. The component weights are summarized in table 2.

Table 2

Factor Explanation of personality traits *(From rotated component matrix)*

Factor	Item wise subcomponents	Component Weightage	Personality trait
Factor 1	Apprehension	0.758	Neuroticism
	Anxiety	0.766	
	Cost-driven decision	0.565	
Factor 2	Goal Oriented	0.696	Conscientiousness
	Rationalism	0.708	
Factor 3	Suggesting/ discussing with others	0.924	Extraversion

To estimate the effects of the factors on decision making towards CAM usage, a linear regression analysis has been done. The model shows CAM usage is driven by Conscientiousness negatively (beta= -0.306, P<0.001) and Extraversion positively (beta=0.693, p<0.001). Neuroticism has not been proved contributing (vide table 3). The equation of this regression is-

Y (CAM usage) = 2.930 – 0.306 X_1 (Conscientiousness) + 0.693 X_2 (Extraversion)

Table 3: The regression table of CAM usage and personality traits

	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
Model	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
(Constant)	2.930	.057		51.441	.000	2.818	3.042
Neuroticism	-.068	.057	-.045	-1.189	.235	-.180	.044
Conscientiousness	-.462	.057	-.306	-8.098	.000	-.574	-.350
Extroversion	1.045	.057	.693	18.308	.000	.932	1.157

Social Effect

The social effect questions are factorized. Component matrix reveals only one underlying factor, i.e. pro-CAM Social Influence Factor. The regression analysis shows decision making of CAM usage is positively influenced by pro-CAM social influence factors (beta= 0.538 ±0.074, p=<0.001), with linear equation as, Y [CAM usage] = 2.930 + 0.538 X [Social Factor]

Effect of Cognitive components

Cognitive factors are tested with logistic regression. It is identified that individual's perception that conventional medicine has side effect [OR=8.178, 95% CI= 2.91-22.97], CAM can treat all diseases [OR=4.158, 95% CI= 1.85-9.31], it's cheaper [OR=2.612, 95% CI= 1.18-5.76] and usage along with Conventional Medicine is better [OR=6.199, 95% CI= 2.66-14.41], are the significant mobilisers of CAM use. The logistic regression table showing influence of cognitive

components on CAM usage is depicted in Table 4. From the significant factors a cognitive factor score has been computed which is later used in integrated model.

Table 4: The logistic regression table of cognitive effect on CAM usage

	B	S.E.	Wald	df	Sig.	Exp (B)	95% C.I.for EXP(B)	
							Lower	Upper
Side Effect	2.101	.527	15.90	1	.000	8.178	2.91	22.97
Empathy	.690	.482	2.053	1	.152	1.994	.776	5.125
Omnipotence	1.425	.411	12.00	1	.001	4.158	1.85	9.308
Conventional fails	-.536	.330	2.640	1	.104	.585	.307	1.117
Cost-effectiveness	.960	.403	5.666	1	.017	2.612	1.18	5.760
Concurrent usage	1.824	.431	17.95	1	.000	6.199	2.66	14.41
Constant	-3.974	.595	44.60	1	.000	.019		

The integrated decision path

The maximum likelihood estimates of the path are calculated and demarked in the figure of the decision model. Path variables, only with significant regression weights are taken. Covariance among the factors is estimated and found to be significant and included in the path diagram. While testing fitness of the model, it is observed that chi square value is 0.19, goodness of fit index (GFI)= 0.989 and other model fit indices are at par. The integrated path diagram lucidly emulates the factors and their effects on CAM preference and usage. As per the maximum likelihood estimates, the relative importance can be quantised in form of regression weights.

Conscientiousness has negative effect on both CAM preference and choice. Similarly, higher disease burden opposes preference towards CAM and is not significant component of 12 months usage of CAM. Past CAM usage has strong negative influence on current CAM usage (standardised weight= -0.21, p=<.001). Strongest predictor of choice behaviour is extraversion and that for preference is cognitive factor. The Integrated Path Model is shown in Figure 2.

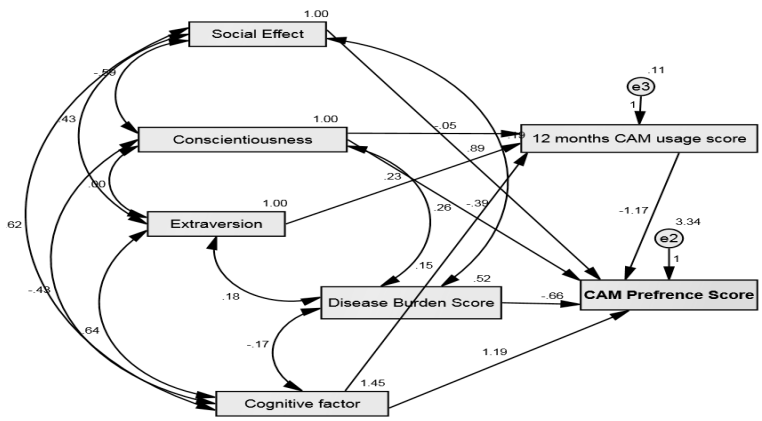

Figure 2. The integrated path model

Discussion

Choosing a treatment modality, in contrast to utilitarian consumer choice, involves people's overall wellbeing and quality of life. This study has taken into consideration the important components of healthcare decision making process, illustrated in studies of shared decision making. The classical linear model of healthcare utilization, based on need – preference-choice behaviour triad has been scrutinised through an integral analysis of multiple factors. This cross sectional study takes two dependent variables in form of 12 month CAM usage, which is considered as individual's choice behaviour and current 'Stated Preference'.

CAM is found to have significant taking among people (40.3% preference and 51.3% usage). This is significantly higher than western countries, which is 26% (Coelho et al., 2010)[13] – 38% (Barnes, 2008)[14]. However, according to WHO (2002)[15], the incidence of CAM prevalence can be as high as 70%. The 11% difference in choice behaviour and preference score (p=0.069) may be explained by post choice dissonance which has been proved to be strong predictor of current preference. Epidemiologic trends are highly intertwined with social effect, in form of decision making practises by discussion within the community. Strikingly, this does not differ among the socio-economic strata. Although Flynn, Smith and Vanness (2006)[16] argue that socio-demographic factors and current health status are poor predictors of patient's preference, current study differs from this view. Rather, demographic factors can be assumed as predecessor of social effect. Social effect has highly significant dependence on Community based decision making practice (R^2=0.103, F=34.37, p=<.001). Again, in contrast to studies of Sirois[6], Coelho[12] where female responders are prone to CAM, this study shows that male responders preferred CAM. As decision in group is found to be a major contributor of CAM preference, acting through pro-CAM social factors, such gender inequality may be caused by less female participation in community meetings.

Personality trait, as a factor of individual's treatment related decision making process, has rarely been described till date. The role of personality factor has been discussed by Flynn and Smith (2007)[11] showing increased conscientiousness most active decision-making style. Whereas, Sörensen et al. (2008) [12] found higher levels of neuroticism, openness, and agreeableness were associated with greater awareness of care needs. This study obviates the statistical significance of neuroticism but emphasises positive effects of extraversion and negative effect of conscientiousness, along with quantising their effects, which has not been done in other studies. Background knowledge, philosophical attitude and perception about cost are the major components of cognitive factor, determining treatment related preference and proving most important predictor of stated preference. This supports the findings of Astin (1998)[17] and MacFadden (2010)[18]

In comparison to Anderson's Healthcare Utilization model, in this study the disease burden plays as need factor; cognitive factor, social effect and personality trait as enabling factors for preference, leading to usage. However, the Anderson's model is unidimensional and essentially hypothesises preference to be congruent with usage. But in the neo-classical studies in economics, preference and choice are often described as independent identities. The integrated path model described in this study aptly delineates this multidimensionality and treats choice and stated preference as different entity. This finding is at par with the calculated predictions by Sirois and Purc -Stephenson, (2008)[6] who modelled social factor, symptom burden and post decision dissatisfaction to be the major players of CAM choice and Wapf and Busato (2007)[8] who emphasised on post-choice behaviour. Hence, this study conceptualizes a new multi-strata decision making model integrating preference-choice model and post-choice holistic preference model.

Conclusion

Apart from identifying a novel trend of integrating different factors into the preference and choice based healthcare utilization, this study also attempt to bridge the gap between behavioural models and economic theories of preference-choice discordance. Besides, the findings can be useful for the social researchers to understand the physician-patient dynamics. Architecture of the integrated model will contribute to betterment of existing conceptual models of healthcare utilization, facilitating the healthcare strategic planning and distribution system related to health human resource management.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: The study is done by voluntary community-based survey. Hence, no Ethical Clearance was required.

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Factors Associated with Use of Dental Sealants among Dental Professionals in Mangalore—A Cross Sectional Study

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Abstract

Introduction: Dental caries is one of the most infectious diseases in the world. Dental sealants have been proved as effective way to prevent caries, hence can play a vital role in preventing caries.

Objective: The primary objective of the study is to obtain insight into dental sealant status and factors associated with sealant use among dental professionals in Mangalore, by a questionnaire method.

Method: A cross sectional, questionnaire based study was done on both private practitioners and professionals working in various colleges in Mangalore, to assess knowledge, attitude, behaviour, perceived effectiveness, willingness to apply sealants, familiarity with recent guidelines and barriers to the use dental sealants in Mangalore city.

Results: A total of 134 respondents took part in study. Half of the respondents (50%) said that they had never applied sealants. A majority (96.3%) of them said that they were willing to apply sealants as a preventive measure. On correlation analysis there was a statistically significant association between knowledge and attitude ($p=0.001$, $r=0.296$), behaviour ($p=0.001$, $r=0.280$) and perceived effectiveness ($p=0.001$, $r=272$). There was also statistically significant association between attitude and behaviour ($p<0.001$, $r=0.433$), perceived effectiveness ($p<0.001$, $r=0.521$) and barriers ($p=0.014$,$r=0.228$). Overall 86.6% of the respondents reported that dental sealants are underused with poor attitude of patients towards sealants being the major barrier for their use followed by unawareness of treatment choice in patients.

Conclusion: The present study highlights the need to change the dental curriculum regarding dental sealants and has definite policy implications for preventive re orientation of dental education and dental practice for long term oral health benefits to the populace. The results also throw light on a number of barriers to the use dental sealants in a developing nation like India, thus indicates the need for patient education and awareness programs for the population in terms of oral health.

Keywords: *Sealants, Pit and Fissure Sealants, Preventive Dentistry, Caries, Caries Prevention, Barriers, knowledge, Willingness, Attitude, Behaviour, Perceived effectiveness*

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Introduction

Among the childhood infections, the prevalence of dental caries is ubiquitous in most developing countries. Over the years, even though the prevalence and severity of dental caries has declined, yet significant population remains at high caries risk [1, 2]. The first global map with data on DMFT for 12 year olds was presented in 1969

by WHO. A data base was established over the number of years showing increase in prevalence of caries in the developing countries[3]. Voluminous literature exists on the status of the dental caries in India. A very extensive and comprehensive National Oral Health Survey conducted in 2004 throughout India has shown dental caries prevalence of 51.9% in 5-year-old children, 53.8% in 12-year-old children and 63.1% in 15-year-old teenagers[4]. In 2005, prevalence record of dental caries in Mangalore, was: 5-7 year ~ 94.3%; 8-10 year ~ 82.5%; 11-13 year ~ 82.5%.[5]

Deep pits and fissures are vulnerable to caries as they are virtually impossible to clean, owing to the tooth anatomy, leading to accumulation of plaque and eventually caries[6]. About 44% of caries in primary teeth are on pits and fissures and about 90% of carious lesions are found in the pits and fissures of the permanent teeth. Pit and fissure sealants can be used effectively as a part of a comprehensive approach to caries prevention on an individual basis or as a public health measure for at risk populations**.** Over more than 11 guidelines and systematic reviews have recommended pit and fissure sealant use for at-risk populations[7,8,9]. In spite of the scientific evidence supporting their effectiveness,[10] they have been underutilized by dental profession[11]. In latest data available indicates just 15 % of children ages 6-17 years have dental sealants[11].

Although there are many reasons for the sparse use of sealants in caries prevention, lack of knowledge about sealants has frequently been cited as a possible determent to its adoption[12,13,14]. It has also been found that the theoretical frame for behavior change is an assessment of knowledge and attitudes affecting practice. However, the adoption of pit and fissure sealants for preventive purposes by the dentists' in Mangalore has not been evaluated. The present study aimed to provide information about sealants to the dentists working in dental colleges and in private dental practices in Mangalore City and to determine whether dentist's knowledge, attitude and practice of sealants could truly be an added link to reduce the prevalence of dental caries. The objectives were to obtain insights into dental sealants status and factors associated with sealant use among dental professionals in Mangalore by accessing the knowledge, attitude, practice and perceived effectiveness by a questionnaire method.

Materials and Method

Study area: Mangalore city**,** Karnataka, India.

Study population: The survey's target population is dental professionals of Mangalore.

Study design: A cross sectional descriptive study was employed in the present study

Sampling Methodology: Purposive sampling technique

Ethical approval: The ethical approval was obtained from the Institutional Ethical Committee of Manipal College of Dental Sciences, Mangalore.

Pilot study: The questionnaire with 46 questions was reviewed for clarity, validity and pretesting of questionnaire was done on 10 dentists - 5 M.D.S & 5 B.D.S. from 1 dental college and 2 individual practice clinics. Questionnaire with minor corrections after the pilot study was slightly modified and final questionnaire was prepared.

Sample size: The sample size was assessed based on convenient sampling technique.

Inclusion Criteria:

- Dentists practicing part time or full time in dental colleges and private clinics in the selected areas
- Dentists who were willing to participate in the study were included.

Exclusion Criteria:

- Post graduates & Interns working in these clinics and colleges.

Samples:

- Teaching faculty (with and without private practice) from different dental colleges in Mangalore
- Dental clinics with individual setup and multi-specialty setups were visited for the survey. 1 dentist per clinic to more than 5 dentists per multi-specialty setups practiced in these clinics was taken in the survey.
- 4 dental colleges in Mangalore were selected.

Data collection: The knowledge, attitude and behavior of the study subjects regarding pit and fissure sealants was assessed by means of a self-administered

questionnaire. Overall, a total of 46 items were included in the questionnaire, with 11 items assessing knowledge, 12 assessing attitude and 11 behaviors respectively. Information pertaining to perceived effectiveness of respondents in applying pit and fissure sealants was also collected by employing 3 questions. Information related to willingness to apply pit and fissure sealants, prior training and familiarity with recent guidelines on pit and fissure sealants was collected by employing 3 questions. Information related to inhibitory factors (barriers) regarding the use of pit and fissure sealants was collected by 5 questions. Information regarding demographic details of the study subjects was also collected.

Scheduling the Survey:

- For dentist in dental colleges: Preferably during working hours of the college (in morning).

- For private practitioners: Preferably evening time was chosen to visit the clinics as evening time is considered to be the peak time of clinics which would ensure inclusion of most of the part time/ full time practicing doctors in the survey.

Data management: Complete questionnaire was coded and spread sheet was created for data entry. The range of possible scores for knowledge, attitude, behaviour, perceived effectiveness and barriers were 0-11, 12-60, 11-55, 3-15 and 5-25 respectively. The range of scores for willingness to apply sealants, familiarity with recent guidelines and previous training were 0-1. Correct answers for knowledge were scored as 1 whereas wrong answers were scored as 0. Five point Likert scale was employed for attitude, behaviour, perceived effectiveness and barriers. However before answering the questions on barriers respondents were asked if pit and fissure sealants are underused, those who answered yes were then asked to answer the barrier section. Score of 1 was given to those who answered yes for willingness, familiarity with guidelines and previous training. Score 0 was given to those who answered no.

Data analysis: Data analysis was conducted by employing Statistical Package for Social Sciences (SPSS), version 20.0 (SPSS Inc, Chicago IL). Demographic variables like age, gender, qualification and work experience were assessed with knowledge, perceived effectiveness, attitude, behaviour and barrier using T test. Association between work place and the domains was calculated using One way anova test. Chi square test was done between demographic variables and willingness, previous training, application of sealants and familiarity with recent guide lines. Pearsons correlation was done to correlate the variation among the domains.

Observations and Results

A total of 134 respondents in the present study were distributed 64 were ≤ 30 years, 60 were male, 85 were MDS, 110 respondents were having ≤ 10 years of experience and Majority of the participants were both dental institution and private practice (n=51). The mean(sd) knowledge, attitude and behaviour scores of the respondents were 5.88(1.85), 49.27(7.07) and 32.31(9.95) respectively. The mean perceived effectiveness and barriers score were 12.90(1.88) and 17.97(1.88) respectively.

The results showed that respondents who had completed their masters training (MDS) had higher mean knowledge, attitude, and behavior & perceived effectiveness scores. Respondents with ≤10 years of experience had higher mean knowledge scores. Respondents working in dental institutions or combined practice/institution had significantly higher mean perceived effectiveness scores than the ones working in private practice (p=0.001 and P =0.007 respectively). Similarly behaviour scores was also significantly higher in individuals attached to an institution compared to those working in private practice($p<0.05$). Half of the respondents (50%) had applied pit and fissure sealants, however 96.3% were willing to apply pit and fissure sealants as a preventive measure. Majority, 52.2% had not undergone any previous training in pit and fissure sealants and 64.9% were not aware of any recent guidelines for pit and fissure sealants. **(Figure 1)**

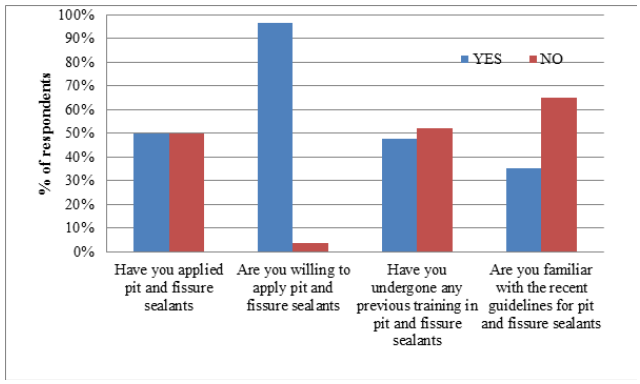

Figure 1: Application, willingness, previous traning and familiarity of pit and fissure sealants

Willingness was significantly associated with educational qualification of the respondents, while

previous training was significantly associated with the type of work place. Familiarity with recent guidelines was significantly associated with educational qualification and the type of work place in the present study. It can also be observed that application of pit and fissure sealants was significantly associated with educational qualification and the type of work place. The results of the correlation analysis indicated that there was a statistically significant association between knowledge and attitude (p=0.001, r=0.296), behavior (p=0.001, r=0.280) and perceived effectiveness (p=0.001, r=272). There was also statistically significant association between attitude and behaviour (p<0.001, r=0.433), perceived effectiveness (p<0.001, r=0.521) and barriers (p=0.014, r=0.228). Statistically significant association was also seen between behaviour and perceived effectiveness (p=0.001, r=0.479) of the study subjects. A majority of the respondents (86.6%) in the present study reported that dental sealants were under used. Various potential barriers to the use of sealants were also probed among the study subjects. Cost factor as a barrier was considered by 64.7% of respondents. On being asked if unawareness of treatment choice in patients was a barrier, a majority (81.0%) said yes, 12.0% were neutral and 7.0% said no. They were asked if poor attitude of the patients towards pit and fissure sealants was a barrier, to which a majority (83.6%) said yes, 8.6% were neutral and 7.8% said no.

Respondents considered lack of good retention of pit and fissure sealants was a barrier to their use (43.9%). Poor attitude of patients towards pit and fissure sealants emerged as a major barrier for sealant use among the study subjects. **Figure 2**

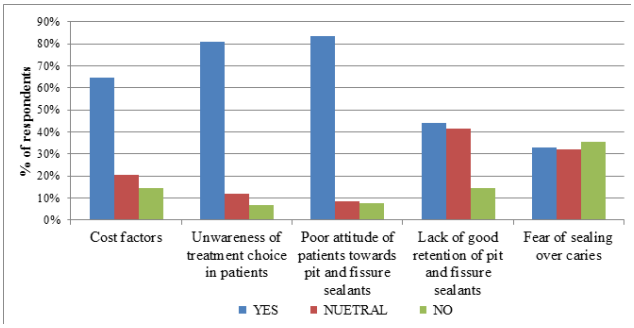

Figure 2: Barriers to pit and fissure sealant use

Discussion

The present study was conducted to explore various issues related to the use of pit and fissure sealants among dental professionals in Mangalore. Numerous systematic reviews have established its clinical efficacy of sealants in the prevention of dental caries[7,8,9]. The present study can pave the way for optimizing the use of sealants among dental professionals in India.

The mean knowledge score percentage of the dentists was observed as 53.46% in the present study. This is in agreement with the findings of Govindaiah et al[15], who reported low knowledge about sealant use among dentists in Florida. In a similar study conducted by San Martin et al[16], the respondents had neutral to favourable knowledge, which is contrasting to that observed in the present study. The findings were also in contrast to a similar study carried out by Asawa et al[17], who reported sufficient knowledge amongst the dentists in Bhatinda, India. It was observed that the mean knowledge scores were higher in professionals with a post-graduate degree as compared to those without a post-graduation degree. This may be due to knowledge and training regarding pit and fissure sealants being imparted to the post graduates during their course. It was also observed that knowledge was higher among respondents with an experience of ≤10 years. This could be due to the respondents having cleared their qualifying examination in the recent years and being familiar with various aspects of sealants. With increasing experience among the respondents, they may tend incline themselves to more practically issues rather than those related to knowledge.

The mean attitude score percentage was 82.11% which is an indication of positive attitude among the respondents. This is in contrast to that reported by San Martin et al[16], who reported neutral to favourable attitude scores among Spanish dentists. It was noticed that the attitude was more positive in dentists holding a post graduate degree. This could imply that the further training received in the form of post-graduation would have had a positive influence on the attitude of the respondents.

The mean behaviour and perceived effectiveness percentage score among the study subjects were 58.75% and 85.97% respectively. San Martin et al[16] have reported neutral to positive behaviour scores among Spanish dentists. It was seen that respondents with a post graduate degree had higher mean behaviour and perceived effectiveness scores than those without a post graduate degree. There was statistically significant difference in mean behaviour and perceived effectiveness scores amongst the different categories of workplace. Respondents working in dental college had higher mean perceived effectiveness than the ones

working in private practice. Respondents working in both private clinics and dental institutions had higher perceived effectiveness scores than those working only in private practice. Involvement in teaching and imparting knowledge to students might have influenced mean perceived effectiveness scores in the present study. Besides, playing the role of a teacher might impart greater perceived effectiveness among the respondents.

Respondents working in both private clinics and dental institutions had higher mean behaviour scores than those working only in private practice. Academic environment provided in dental institutions does have a role to play in the observed results. However, further studies are required to shed more light into the potential role of workplace on sealant use.

On being enquired if they applied pit and fissure sealants, only half, 50% of the respondents reported that they apply sealants. This is in contrast to that reported by Main et al[18], who reported that 90% of respondents in Ontario apply sealants in their practices. The results are also in contrast to that reported by Govindaiah et al[15], who reported that 98% of respondents in Florida apply sealants as a routine preventive measure. The results of the present study indicate that pit and fissure sealants are underused in Mangalore. The potential role of barriers to the use of sealants should be further explored to address the reasons for the same. The study subjects were also enquired if they were willing to apply pit and fissure sealants, to which a majority of 96.3% of them responded in the affirmative. This reflects the positive attitude of respondents towards the use of sealants. The results of the present study are thus encouraging, and act as a facilitating factor for further training and implementation of sealant use among the respondents.

When enquired if they had undergone any previous training for the application of dental sealants a majority of 52.2% replied in the negative. This might be due lack of emphasis on pit and fissure sealants during their undergraduate and/or postgraduate training. This might also be due to lack of continuing professional development programs and/or workshops on pit and fissure sealants.

On being asked if they were familiar with the recent guidelines for pit and fissure sealants a majority of 64.9% replied that they were not familiar with the same. This is in agreement with the findings reported by O'Donnell et al[19] among American dentists. The lack of accreditation systems after graduation might be one of the factors influencing the aforementioned results. Willingness to use sealants was significantly associated with educational qualification and previous training was significantly associated with the type of work place of the respondents. Similarly, familiarity with guidelines was significantly associated with educational qualification of the study subjects.

Knowledge showed significant correlations with attitude, behaviour and perceived effectiveness, while attitude showed significant correlations with behaviour, perceived effectiveness and barrier scores. Results also revealed significant correlations between behaviour and perceived effectiveness scores among the respondents. Application of pit and fissure sealants was also associated with workplace and educational qualification. Greater academic exposure might favourably influence various aspects of use of sealants among the study subjects. Being involved in training students might entail dental professionals themselves undergoing some form of training in sealant use. Preventive measures might not be cost effective in the short term, but they are cost effective in the long term. Employing dental auxiliaries to provide sealants might further offset the cost of sealant application.

When asked if unawareness of treatment choice in patients was a barrier, a majority of 81% of the respondents reported in the affirmative. This in indicative of the lack of awareness about preventive dentistry amongst the patients. It becomes imperative on the part of dental professionals to explain to their patients about the benefits of pit and fissure sealants.

Poor attitude of patients towards pit and fissure sealants has been the most significant barrier with 83.6% of the dentists agreeing to the same. Dental professionals help is sought only if there is pain to the patient. They may fail to appreciate the value of using pit and fissure sealants when there is no pain in the teeth. Sealant use is also compounded by the fact that milk teeth are lost anyhow. Spending money and time on the care of painless milk teeth might be perceived to be of no apparent importance. The present study highlights the potential role that dentists can play in informing the patients about the potential benefits of sealant use.

A majority, 43.9% of the respondents reported that lack of good retention of pit and fissure sealants was a barrier to their use. This could be because application of

pit and fissure sealants is technique sensitive and requires previous training. In a study conducted by Olmsted et al[20], simple clinical practices using 4-handed dentistry and strict isolated techniques led to 95% or higher cumulative sealant retention rate. The respondents were also asked if fear of sealing over carious lesions was a barrier, to which a majority of the respondents, 35.3% did not concur. This is in contrast with the finding reported by Govindaiah et al[19] in which 44% of the respondents agreed that the possibility of sealing in decay was a major concern in using dental sealants as a preventive measure. Results of the present study are also in contrast with those reported by Asawa et al[18] who reported that 80% of the respondents were avoiding sealants out of fear of sealing over caries.

The results of the present study represent to one geographical area. Further, research related to sealant use among dental professionals in various parts of the nation is thus warranted to have a representation of all dental professionals in India.

The present study has definite implications for curriculum changes in dental education in India. Appropriate modifications in dental curriculum might be one of the ways in which issues related to low knowledge scores on sealant use among the respondents can be addressed. The present study highlights the need for greater emphasis on preventive care of the patients during undergraduate and postgraduate training. Regular continuing professional developmental programs which highlight the long term benefits of sealant use are also the need of the hour. High attitude and willingness scores of the respondents towards sealant use are encouraging and might indicate that the respondents have favourable disposition towards further training regarding the same.

Policy changes regarding the need for greater emphasis on the longterm benefits of preventive care is of critical importance. This is of special relevance in the context of developing and underdeveloped nations, which face greater disease burden as well as a definite shortage of resources.

Conclusion

The present study highlights the need for changes in the dental curriculum regarding the use of pit and fissure sealant. Policy makers and decision makers should consider placing greater emphasis on preventive dentistry in the dental curriculum in India. Continuing dental educational programs on preventive dentistry in general and sealants in particular will have to be conducted on a regular basis for dental professionals. The present study has definite policy implications for preventive re-orientation of dental education and dental practice for lo long term oral health benefits of the populace. The results of the present study are especially relevant in the context of a developing nation like India with an increasing burden of oral diseases and a definite paucity of resources. Dental professionals might be more receptive towards further training in sealant use and other aspects of preventive dentistry. The study also throws light on various barriers to the use of pit and fissure sealant, out of which poor attitude towards the application of sealants was the most significant. Thus, the role of awareness programs for populations regarding preventive dentistry should be assessed in details.

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Conflict of Interest: NIL

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In Vitro Comparative Study of Dimensional Stability of Three Different Polyvinyl Siloxane Interocclusal Recording Matereials after Storage for Different Time Intervals of 12Hours, 24Hours, and 48Hours

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Abstract

Background: Interocclusal recording materials are generally used in prosthetic dentistry to register the jaw relationship. These materials have a wide range of viscosity, elasticity, and volumetric changes within various material groups. Newer elastomeric interocclusal materials are chemical modifications of elastomers whose comparative properties relevant to clinicians are yet to be studied.

Aims: To compare the dimensional change between the polyvinylsiloxane bite registration materials manufactured by different brands within the duration of 12hours,24hours, and 48 hours storage.

Methodology: The dimensional changes of the different polyvinylsiloxe bite registration pastes were compared three - dimensionally in different time intervals with the standardised die measurement was 25mm between the vertical lines .

Conclusion: Within the limitations of the study, it was found that all 3 interocclusal recording materials NEOSILK, CADBITE, AND O-BITE showed no significant distortion when stored in-vitro for 12 hours. All Materials showed significant distortion when stored in-vitro for 24 hours and 48 hours. All three materials showed more distortion when stored in 48hours compare to 24 hours. Among polyvinyl siloxane interocclusal recording materials NEOSILK showed better dimensional stability when compared with CADBITE and O-BITE when stored in-vitro 24hours and 48hours. Hence we recommend Neosilk bite material for better dimensional stability when compare with other materials.

Keywords: *Dimensional stability, comparison, bite registration pastes*

Introduction

The stomatognathic system in humans is a complex that combines the organs, structures and nerves involved in a multitude of functions like speech, mastication and deglutation. Functions of occlusion can influence the overall pattern and the foundation of the stomatognathic system. Long term success of any restoration is dependent on maintenance of harmony between various components of stomatognathic system. The goal of any restorative treatment is to establish posterior occlusal contacts that stabilize the occlusion and to provide anterior guidance which will provide predictable amount of disocclusion during protrusive and lateral excursions. To achieve proper occlusion in a dentate or edentulous patient, the precise articulation of patient's diagnostic or working casts is a required. Recording and transferring of accurate existing occlusal records is of prime importance for a successful restoration.

Interocclusal recording material should ideally become rigid enough to resist distortion that might result from the weight of the dental casts and exhibit minimal dimensional change after setting before mounting of the casts in the articulator.

The basic principle approach should be that the interocclusal record must be at the correct vertical and

horizontal relation with an accurate, dimensionally stable recording material and recording of eccentric maxillomandibular relations an appropriate method of mandibular guidance.[1] Among the errors in interoclusal recording, only iatrogenic and material based ones are preventable by the operator. Hence, it is essential to know properties of interocclusal recording material.[1]

Earlier interocclusal recording materials were impression plaster, bite waxes and zinc oxide eugenol pastes. The newer materials polyvinyl siloxane and polyether are being used commonly due to their elastic properties and dimensional stability. The polyvinylsiloxane bite registration materials have the advantages of less rigidity with easy removal from undercuts compare to polyether materials.

Hence, this study was done to study the dimensional change between the different polyvinylsiloxane interocclusal recording materials commonly used in clinical practice namely CADBITE, NEOSILK AND OBITE at different time intervals.

Materials and Method

The following polyvinylsiloxane interocclusal recording materials were selected for the study: Viz. Virtual CADBITE, NEOSILK, and O-BITE interocclusal recording materials.

Armamentarium used for the study were Stainless steel die (ADA specification – 19), OPUS Nikon profile projector, Auto mixing gun with mixing tips and permanent marker.

1. Preparation of stainless steel die:

For the present study 2 stainless steel dies were prepared according to ADA specification No.19 for preparation of test specimens with different polyvinyl siloxane bite registration materials. According to ADA specification 19 each die consisted of a cylindrical stainless block of 38mm diameter, with 30mm diameter step on its superior surface. The die was scored with 3 horizontal lines and 2 vertical lines on the top of impression surface . The horizontal lines were marked as X, Y, Z and vertical lines were marked as CD and C'D' for ease in making measurements. The distance between two horizontal lines was 25mm and between two vertical lines was 25mm. The die was subjected to Nd-YAG Laser treatment and 3 horizontal and 2 vertical line were scribed, with the width of 0.016mm on top of 30mm diameter surface. According to above-mentioned specifications a total 2 dies were prepared.

Each die had a highly polished surface and also contained a ring that surrounds the periphery of it, which serves as a tray or as a container for the interocclusal recording material.

2. Manipulation of Materials:

olyvinyl siloxane materials were supplied in the form of cartridge containing base and accelarator paste. Manufacturer's instructions were meticulously followed for manipulation and the material which extruded from gun was uniformly spread over the surface of the die. Glass plate covered with polyethelene sheet was placed on the die over with a weight of 500g was kept and allowed to set for 4-5mins.

3. Specimen fabrication:

Each material was manipulated as mentioned above and total force of 5.55N was applied. The whole assembly was then submerged into a water bath for the setting time suggested by manufacturer plus 3mins to ensure polymerization. After removal from water bath the material was separated from the die by using brass disk or Riser to remove the excess flash trimmed using scalpel. Thus prepared specimens were measuring 30mm in diameter 3mm in thickness and had lines X,Y,Z,CD,C'D' lines on it . Similarly all the 40 bite registration record samples were obtained.

In between the days of observation, the samples were stored in moisture free polyethylene bags at room temperature of 28±2 ^{o}C.

4. Testing of specimens:

The distance between the lines, CD and C'D' reproduced on the sample, was measured at three different points PP', QQ' and RR' (i.e. intersections of these lines with the lines XYZ) by using Nikon Profile Projector V-12 with 10X magnification. Readings were obtained for each sample, and the mean of these three values were noted. Likewise, readings were made at different time intervals, viz. immediately after removal of the material from die, 12hours, 24hours and 48hours, respectively for each of the samples. All the readings thus obtained were tabulated and subjected to statistical analysis for the comparison and correlation of dimensional stability.

Statistical Analysis

The descriptive statistics was given by mean and standard deviation. The dimensional change over time was analysed by Friedman's repeated measures (ANOVA). For significant values, post hoc test was done using Wilcoxon Signed Rank test (Paired). At every time interval, the groups were analysed by Kruskal Wallis test with post hoc Dunn test, where values were significant. $P < 0.05$ was considered significant. Analyses were performed with IBM-S

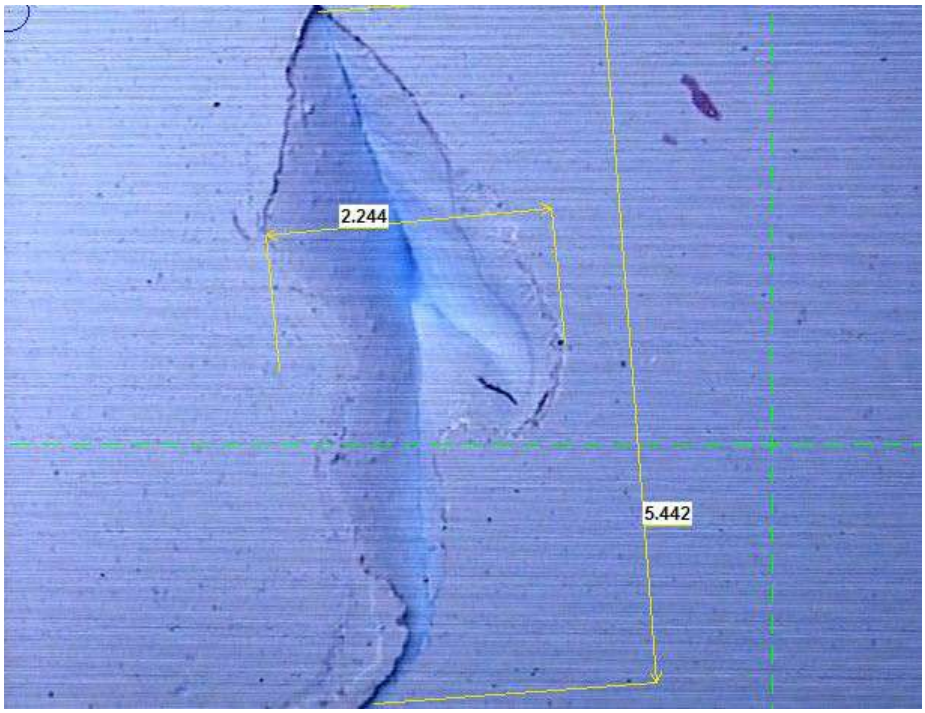
Result

Table 1 – Dimensional Stability of the Bite Registration Pastes

Brand	12HRS	24HRS	48HRS	P Value
CAD-BITE	24.72 ± 0.0424	24.70 ± 0.0759	24.66 ± 0.0884	0.1224*
NEO SILK	24.73 ± 0.0297	24.72 ± 0.0272	24.71 ± 0.0352	0.2019*
O-BITE	24.73 ± 0.0282	24.62 ± 0.1325	24.51 ± 0.2161	**0.0055*$**
P Value	0.8866**	0.4682**	0.1636**	----
P value (PostHoc)	NA	0.05876#	**0.01242#$**	----

*-Friedman's Repeated Measures ANOVA; **-Kruskal Wallis Test; #-Wilcoxon Signed Rank Test (Post Hoc); $-Statistically Significant.

Figure – 1: Metallic master die with riser



Figure–2. View of the sample seen through Opus Nikon Profile projector (Representative photograph)

Discussion

The properties of the dental materials vary with the temperature and humidity. Most of the materials used in prosthodontic procedures should be stored in the ambient temperatures to maintain their shelf life. The operator skill in the manipulation of the material is very important apart from the storage conditions of the material.

The dimensional changes in the recording materials will not transfer the true maxilla-mandibular relation from the mouth to the articulator and the prosthesis fabricated will have occlusal contacts in the mouth different from the one fabricated in the articulator. The time elapsed between the interocclusal record, and the mounting in the articulator extends up to three days as the work is sent to distant laboratory. The casts and the interocclusal record are sent to laboratory in different conditions as separately with the casts, casts tied with the rubber bands or mounted immediately. The dimensional changes in the interocclusal recording materials can be expected when the material is removed from the mouth due to the variation in the temperature between the oral cavity and the dental office and the plastic deformation when the material is removed from the mouth. This distortion is possible even when the casts are mounted immediately.

The distortion of the material is expected when the upper and the lower casts are tied using the rubber bands with the interocclusal material interposed and transferred to the laboratory. This distortion is due to the constant pressure till the casts are mounted in the articulator by the laboratory technician.

The time elapsed between the interocclusal recording and the casts mounted in the articulator will cause distortion due to the prolonged setting or polymerisation and the variation of the temperature between the dental office and the laboratory. The average time for mounting of the casts using the interocclusal record varies from few hours when the laboratory is situated locally to two days when sent to distant place.

The current study was done to assess the distortion of the interocclusal record at the intervals of 12 hours, 24 hours and 48 hours similar to the normal clinical situations. The study was done with the interocclusal record without any pressure application to check distortion at different time intervals.

Poly vinyl silicone and poly ether materials, when used as interocclusal materials solved most of the problems associated with the earlier materials. These materials are elastic with moderate stiffness (elastic modulus) so that they can be removed from the mouth and mounted in the articulator without breakage.

These materials are supposed to high dimensional stability, as they do not release any by-product during polymerisation. Polyvinyl siloxane materials have lower stiffness with the comfortable removal from the mouth and mounting with articulator than the polyether so that poly vinyl siloxane interocclusal materials are commonly used as interocclusal record.

Direct interocclusal record is the most commonly used technique to record maxilla-mandibular relationship. The recording material is soft initially, and it fills the space between the teeth, hardens, and records the specific relationship of the arch. The set material is transferred to cast and mounted on the articulator.[3]

Nisan et al. observed that addition type polyvinylsiloxane was the most accurate and stable interocclusal recording material. Previous studies have also demonstrated that handling PVS bite materials remain dimensionally stable up to 7 days.[4] Many authors have evaluated the dimensional change of bite registration materials by means of stone casts and different devices such as three dimensional Zeiss meter, digital caliper, microscope, and stereomicroscopes and Profile Projectors.[4, 5, 6] In the current study Nikon Profile Projector was used for the evaluation of dimensional stability due to its higher precision combined with ease of use.

The stainless steel die used in the present study was similar to the standard die given by ADA specification No 19.[7] The surface of this die is smooth and shiny; therefore, it is easier to evaluate dimensional changes compared to tooth surface with cusps and fossa. In the standard ADA dies, the diameter and angles of the flutes are important for evaluation of the accuracy of impression materials.[8] This study evaluated the distance between the vertical lines at different time intervals with different interocclusal recording materials. The test die has 25mm distance between the vertical lines.

The distance between vertical lines for Cadbite poly vinyl siloxane interocclusal material in the present study was 24.71 mm for 12 hours, 24.72 mm for 24 hours and 24.62 mm for 48 hours. In Neosilk poly vinyl siloxane interocclusal material the measured values between the vertical lines was 24.74 mm for 12 hours, 24.71 mm for 24 hours and 24.68 mm for 48 hours. In O-Bite material it was 24.72 mm for 12 hours, 24.30 mm for 24 hours and 24.31 mm for 48 hours.

Balthazar-Hart et al, (1981) had done a study with polyether and zinc oxide eugenol paste and concluded that Polyether shows the least distortion, and zinc oxide eugenol paste presents higher distortion.[9] Lassila et al, in 1986 had done a study with acrylic resin, zinc oxide eugenol pastes and elastomeric materials and concluded that elastomeric materials have good dimensional stability when compared with acrylic resin and zinc oxide eugenol paste.[10] Karthikeyan et al, in 2007 has done a study with polyvinylsiloxane bite material, zinc oxide eugenol pastes, and bite registration wax (aluwax) and concluded that Polyvinylsiloxane (Virtual, Group A) was dimensionally more stable followed by zinc oxide eugenol paste (Superbite, Group C) and then Bite registration wax(Alumax, Group B).[11]

According to the results obtained in a study done by Sampath Kumar Tejo et al in 2012, Polyether was found to be more dimensionally stable than polyvinylsiloxane followed by zinc oxide eugenol.[12] They recommended the use of polyvinylsiloxane recording material should be articulated within 24 hrs. They also recommended that polyether should be articulated within 48 hrs and Zinc oxide eugenol within 1 hr to prevent distortion. Polyvinylsiloxane bite registration material is popular contemporary bite registration material along with polyether material.

The newer polyvinyl siloxane bite registration materials used in this study Cadbite, Neosilk and O-bite have a major composition of vinyl polysilaxone, methyl hydrogen siloxane, silicone dioxide. They polymerize by addition polymerization and do not form any by-product in the reaction. They have longer polymerization period resulting in sustained contraction period. These are the reasons for these materials being more dimensionally stable than earlier materials.

Conclusion

Within the limitations of the study following conclusions were drawn. Polyvinyl siloxane interocclusal recording materials NEOSILK, CADBITE, and O-BITE showed no significant distortion when stored in-vitro for 12 or 24 hours, but showed significant distortion when stored in-vitro for 24 hours and 48 hours. Among polyvinyl siloxane interocclusal recording materials NEOSILK showed marginally better dimensional stability when compared with CADBITE and O-BITE when stored upto 48 hours.

Conflict of Interest: No conflict of interest

Source of Funding: Self

Ethical Clearance: Taken

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Factors of Happiness among Indian Adolescents

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Abstract

The main objective of the study was to explore the factor of happiness among the adolescent's students the other objective was to formulate the theoretical structure of the happiness for the adolescent's population of Chhattisgarh India. For these purpose 250 adolescents studying in different schools of Chhattisgarh constituted the sample for the study. The students were asked to give an open-ended answer to a question "what makes them happy" analysis was performed for their responses 28 common responses after analyzing the responses were identified. A hypothetical exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) was computed to find out the factors of happiness among adolescents. The results of the EFA revealed 5 factors of happiness for adolescents. The results of CFA reveal a low correlation between the 5 factors.

Keywords: *Happiness, EFA, CFA,*

Introduction

In psychology, happiness is a mental or emotional state of well-being which can be defined by positive or pleasant emotions ranging from contentment to intense joy. Happiness has been considered a major life goal in common philosophy[(1)]. In the present generation, happiness is an amazing thing. We all want to experience, for the reason that happiness is one of the most important values in life for all human[(2)]. Happy mental states may reflect judgments by a person about their overall well-being. *Happiness is when what you think, what you say, and what you do are in harmony.* Happiness is defined as a multi-dimensional component of unconscious, cognitive, and motivational processes that are unique to how life is interpreted and received by individuals[(3)]. A commonly used definition of happiness is the degree to which an individual judges the overall quality of his/her life as a whole favourably[(4-6)]. *Happiness is when what you think, what you say, and what you do are in harmony.* The concepts of happiness affected by the cultural and historical variations, many studies have identified individual-level factors of happiness, such as biological, personality, lifestyle, socio-demographic and socio-economic factors[(7-11)]. Definitions of happiness vary with respect to region culture. It is reported that various definitions are available worldwide[(12)]. In contemporary psychology, there is much emphasis on well being, contentment and Happiness. People are healthy normal but feel discontentment. Happiness issue is major public health situation it differs according to different stages of life. The adolescent stage is a transition stage adolescents suffer from emotional turmoil and stress[(13-14)]. It is important to explore the factors of happiness among Indian adolescents. Development of a screening tool of happiness among adolescents in the Indian context is essential. There is a dearth of studies on happiness factors of Indian adolescents'. Hence, there is a need to find out the factors of happiness in Indian cultural contexts and to develop culturally appropriate assessment measures for happiness. For this purpose, the main objective of the study was to find out the factors of happiness and to examine the theoretical structure of the happiness of the Indian adolescent population. Therefore a study exploring happiness among adolescents has been undertaken which highlights the factors contributing to happiness reactions of adolescents and can provide a baseline for the development of the tool.

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Method

Sample

The total 250 (125 male & 125 female) adolescent's participants of the study were selected from Raipur, Bhilai and Durg, cities of Chhattisgarh. Mean age of the was =19. Incidental random sampling technique was used for the selection of the participants.

The adolescents who fulfilled the following criteria were included in the study:

Inclusion criteria

- Students of class 10, 11 and 12.
- Able to communicate, read, write and comprehend in English.
- Willing to participate.

Exclusion criteria

- Students below 10^{th} class and above 12^{th} class were not included in the study.
- Not present at the time of the study.
- Not willing to participate in the study.
- Those with any chronic disease were excluded.

Design

The survey research design was used.

Procedure

Participants, who met inclusion criteria, were contacted individually, it was essential to making rapport with the participants, to win their trust. They were ensured that their information will be kept strictly confidential. The information given by them would be used for research purpose only. After getting consent in writing from the participants, they were interviewed. Qualitative information related to the happiness of the adolescents was gathered by putting one Question "What are the events that make you feel happy. 28 dimensions were observed in the responses of the adolescents further the 28 dimensions were put to exploratory factor analysis and confirmatory factor analysis the results of which are given in the figure.

Statistical Analysis

The data were analyzed by excel, SPSS 16.0 version and ADANCO (advanced analysis of composites) version 2.0.1[15]. Responses from participants were coded and entered into SPSS. Missing data were excluded from the relevant analysis. To have an idea of the basic factors of the happiness in Chhattisgarh state, India, maximum likelihood method was performed to explore the links between the observed and latent variables, and to identify the factor structure. The nature of the principal component analysis is exploratory rather than confirmatory[16]. The factors with eigenvalues greater than 1.00 were retained. Factor coefficients of 0.40 or greater can be used for the interpretation of the factor structure[17]. The factors showing more than .40 coefficient were interpreted as a factor structure[18]. Confirmatory factor analysis (CFA) was used with ADANCO.

Results

Mainly two types of factor analysis were used in the study: exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The EFA approach describes how and to what extent the observed variables are related to their latent constructs.

Exploratory Factor

To conduct the exploratory stage of factor analysis, extraction methods in Principal Analysis Factoring technique (PAF) was used. The method was chosen from the available methods because it is a good method for assessing the underlying dimension of a domain. Varimax rotation was used for factoring methods. Five factors were identified from the initial domain run that exhibited eigen values greater than one.

Varimax rotation was done to clarify the loading on these factors. There were 28 domains which had significant loadings on any of the five factors. Obtained loading of items on the five factors is presented in the figure-1. Kaiser – Mayer - Olkin (KMO) value for eighteen domains were found to be .652 which indicates the sample is adequate. Education 10.36%, Sociability 10.13%, Health 9.66%, Entertainment 8.82% and Sensation Seeking 8.14% overall responses explained 47.12% of the variance. In the field of social sciences factor loading is considered minimum 0.30 or 0.35 when sample size less than 100, but above 200 minimum cut – off above 0.40 was considered[19]. Also in the field of

social science research Communalities (h^2) is generally considered between a range of 0.40 to 0.70,[20].

Confirmatory Factor Analysis

A measurement model was tested for all samples using confirmatory factor analysis (CFA) after the EFA. Model fit was excellent in all samples:

Model fitting – Model fit analysis was performed for a decision on the goodness of fit. The fitness of the model was excellent with the data it was evaluated with guideline [{the Unweighted least squares discrepancy (d_{ULS}) P < .01, The geodesic discrepancy (d_G) P < .01[15] and the standardized root mean squared residual (SRMR) P < .01}].

Table 1. Confirmatory factor analysis (Decision on model goodness of fit)

The goodness of model fit (saturated model)	Value	HI95	HI99
SRMR	0.0863	0.0632	0.0661
dULS	1.4144	0.7592	0.8299
dG	0.4193	0.2603	0.2805

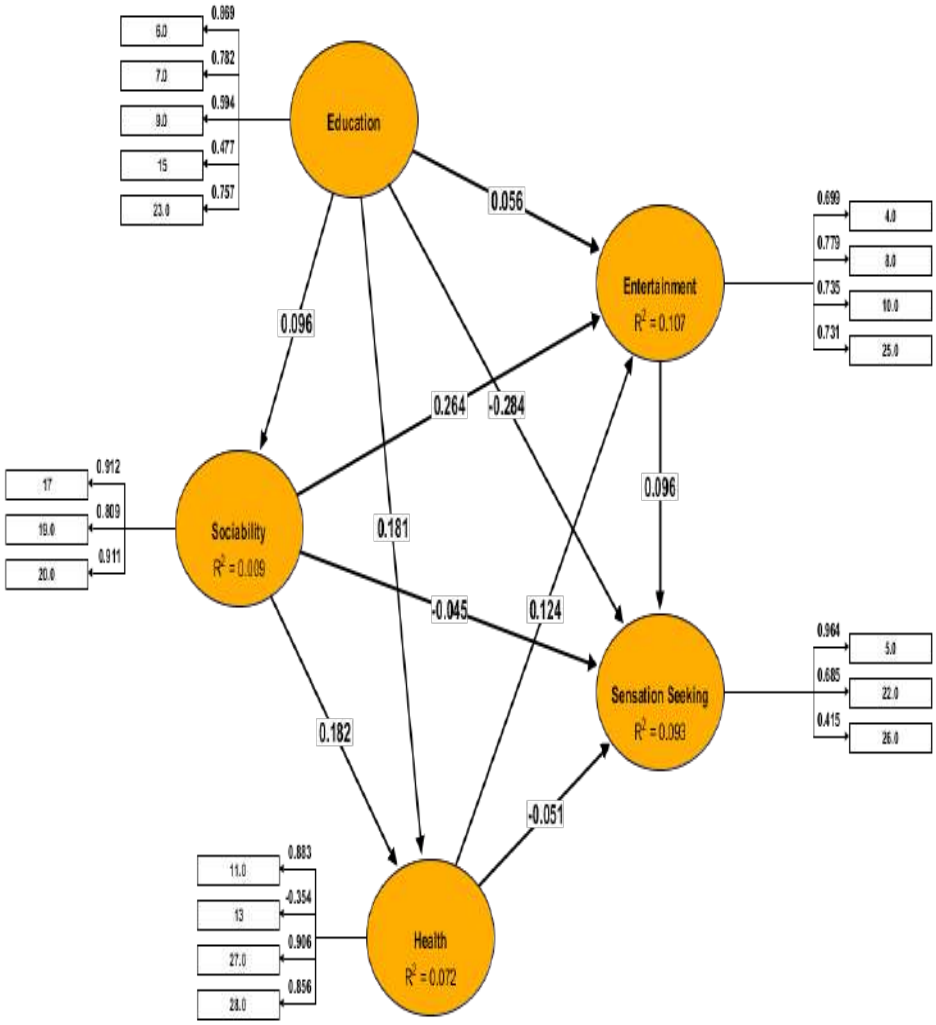

Figure 1 SEM explaining factorial validity and regression weight of factors for happiness

(6.0=Academic Achievement, 7.0=work completion, 9.0=study, 15=obey the teacher, 23.0=learning, 17=purchasing, 19.0=surprises, 20.0=shopping, 11.0=food, 13=independence, 27.0=hygiene, 28.0=health, 5.0=trawling, 22.0=nature, 26.0=adventure, 4.0=t.v. movie, 8.0=music or dance, 10.0=outdoor work, 25.0=festival).

A measurement model was tested for all samples using confirmatory factor analysis. In this model, factor educations explain the five subcomponents: Academic Achievement, work completion, study, obey the teacher and learning. Factor sociability explains the three subcomponents: purchasing, surprises and shopping. Factor Health explains the four subcomponents: food, independence, hygiene and health. Factor Sensation Seeking explains the three subcomponents: trawling, nature and adventure. Entertainments explain the four subcomponents: television. movie, music or dance, outdoor work and festival. (Figure 1) shows the regression weights. All values depicted in Fig.1 for all adolescents students- Academic Achievement, work completion, learning, purchasing, surprises, shopping, food, hygiene, health, trawling, nature, t.v. movie, music or dance, outdoor work, and festival show the largest values (>.68). The study, obey the teacher, independence and adventure show the lowest weight for the sample (.59 to .35). The results of CFA also indicate low correlation between the 5 factors.

The result of factor analysis revealed five important factors namely- Education, Sociability, Health, Entertainment and Sensation Seeking, which are predicts 5 domains in Education, 6 domains in Sociability, 4 domains in Health, 5 domains in Entertainment and 06 domains in Sensation Seeking. The statistical properties reveal that the all happiness factor is reliable in the Indian population.

Discussion

The result of the present study revealed 5 factors of adolescents' happiness is. Education, Sociability, Health, Entertainment and Sensation Seeking, by sociability it is meant that adolescents feel happy when they are free to purchase, give surprises to others and they love shopping. For adolescents education also matters, particularly good performance in academics, studying obeying the teachers make them feel happy when they are acknowledged. The young adolescents enjoy food and are also more pleased in hygienic conditions. They also like adventurous activities, traveling, and nature, they like thrilling experiences. Many adolescents love entertainment, enjoy music, movies & festivals.

The finding of the various researches provides support for an association between social and physical environmental factors and happiness. For example, social environmental factors such as neighborhood social capital have consistently been positively associated with happiness and related constructs such as subjective well-being[21-23]. Some aspects of the physical environment have also been studied extensively; found that settings that were aesthetically more attractive and had more green space have consistently been related to higher levels of happiness[24-27]. Perceived access to public transport, culture and leisure facilities have been positively related to happiness[24]. while another study found that happiness to be more closely associated with cultural, sporting, shopping and transport amenities (place variables) among young people and with quality of government services (performance variables) among older people[28].

Thus the results of the present study are important in understanding adolescent's happiness and accordingly help them to overcome the stress. Various studies have revealed that students who have high-stress levels are less likely to report high perceived happiness[29]. The study suggested that students were least happy about their financial situation, at work, and at school, low perceived happiness reported higher stress levels and lower emotional closeness to others[30]. The finding of the present study are in line with the findings of the study reported that adolescents who reported sufficient time spent with family members and the highest level of love and connectedness were happiest[31]. Those living in a two-parent family were happiest, followed by those living with a married father or a married mother (in a single parent family). Those living in an unmarried mother family were unhappiest, controlling for household economic status. These findings highlight the important role of a father in a country with a matriarchal family system. Regarding non-family factors, adolescents with the highest school attendance, highest self-esteem, and highest economic status who also regularly participated in extracurricular activities were happiest. Adolescents who were older and who had to do chores regularly tended to be less happy than their peers. The reason for the findings of the study can be included as every adolescent belongs from different family environment, the family attention, parents' time to share care, parental cooperation and conversation with their children, drug addiction, and financial condition, etc., of the family, is important factors for adolescent happiness. The factors identified for happiness among adolescents provide a base for the development of happiness scale.

Conclusion

The happiness among adolescents is an area which is a major concern among society members and requires exploration of happiness factor for adolescents in the present study. 280 adolescent students responded to their happiness reasons. The results of CFA reveal 5 domains which lead to happiness among adolescents. The present work has application in understanding the factors of happiness among adolescents and accordingly their behaviours can be dealt. The work is also helpful in the development of tools for the measurement of happiness among Indian adolescents' population. The measurement of happiness would be helpful in the health sector because happiness can increase physical activity and significantly decrease depression[32]. Physical activity makes us look better, feel better, and sleep better by releasing dopamine into the brain.

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Note-The study was approved by departmental research committee.

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Clinical Decision Making for Biopsy of Oral Mucosal Lesions

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Abstract

Accurate diagnosis and treatment of oral diseases is an essential component of a comprehensive oral care practice. Accurate diagnosis also helps formulate the appropriate treatment plan and helps to avoid further complications from inadequate treatment and to avoid adverse effects from treatment that is not necessary for the particular patient. Obtaining an oral biopsy allows the clinician to diagnose many precancerous conditions and ensure early treatment. Biopsy may be the gold standard for final tissue diagnosis but any invasive procedure comes with its own risks and side effects. When a clinician is faced with a patient with signs and symptoms that are suggestive, but not diagnostic of a disease, he/she has the responsibility to decide between the option to treat empirically or not to treat or to perform further diagnostic tests. This paper aims to review the basic indications and contraindications of performing an oral tissue biopsy and to identify different oral mucosal lesions that may benefit from empirical therapy better than a biopsy in the early stages. Knowledge of these lesions will help the clinician avoid the undesirable outcomes that may be associated with an oral biopsy.

Keywords: *Biopsy, Oral lesions, Decision analysis, Oral Mucosa, Oral Medicine*

Introduction

"Biopsy" is the process of obtaining a sample of tissue from a living body with the objective of providing a confirmatory histopathological diagnosis following microscopic examination of the tissue sample. Biopsies are important diagnostic tools for the diagnosis of lesions ranging from periapical lesions to benign mucosal lesions to malignancies. In general, when the clinician is well-versed with anatomy, biopsy will be a safe and reliable diagnostic tool. But, biopsies should only be performed by the clinician if a thorough clinical examination has been done and all prior investigations have been performed. This will help avoid untoward consequences or iatrogenic induction of complications.[1]

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The patient's main concern is for a quick and painless procedure which serves the diagnostic purpose. The pathologist always appreciates receipt of an undamaged specimen that is properly labeled and handled by the clinician. So, the clinician performing the biopsy has the responsibility to ensure that all parties involved are satisfied.[2] This can be done only with the appropriate knowledge of the indications, contraindications, pros & cons of performing a biopsy and also knowledge of the situations where biopsy may not be initially necessary in order to satisfactorily treat a patient.

Types of Biopsy

The different situations which might warrant a biopsy in a dental setup include oral mucosal lesions, apical lesions associated with teeth, lesions associated with jaw bone, mucocutaneous lesions, suspected malignancies and precancerous conditions.

Direct biopsy is when the lesion lies superficially with ease of access. Indirect biopsies will have to be done in lesions which are located in deeper tissues and are covered by normal appearing mucosa or tissue.[3] The incisional technique involves removal of a representative part of the lesion along with a part of the healthy tissue. It

is indicated when the lesion is large, difficult to remove in entirety, in a complicated location or if it is part of a systemic disease process. The excisional technique is used when the lesion can be removed in toto with a peripheral safety margin.[4] Intraoperative biopsies are speedily processed and diagnosis is received in the operating room in a short period of time, which allows the clinician to continue as required. The various procedures involved in processing the biopsy specimen includes, fresh examination, frozen sectioning and paraffin/methacrylate embedded examination. [5]

Approach to Lesions:

A systematic approach should be sought for every oral lesion with the chief complaint as the starting point of the investigation. There are certain points which would help the clinician decide whether biopsy is the right investigation. Biopsy should be done to confirm clinical and radiographic findings and for the purpose of determining the type of treatment to be instituted in certain diseases or it should be for the purpose of teaching, for eliminating cancerophobia or for the purpose of medico-legal records if needed.[6]

Indications And Contraindications Of Oral Biopsy:

Indications

Biopsies should be taken for lip and oral lesions that do not originate from apparent local irritating factors (trauma or inflammation). Lesions which persist for more than 3 weeks and lesions suspected of malignancy should also be biopsied. Rapidly expanding lesions and those that cause pain, paresthesia and other ominous symptoms and lesions that were considered benign but have subsequently undergone significant changes in the appearance should also be biopsied. Biopsies are also useful in confirming cases of certain lesions resulting from infections such as syphilis, tuberculosis, deep fungal infections, and some lesions of mucocutaneous vesiculobullous type.[7] Rapid bone loss, irregular widening of the periodontal ligament, spiking root resorption and tooth mobility in the absence of identifiable traumatic or inflammatory causes are the ominous signs that warrant a biopsy.[8]

Contraindications:

Oral biopsies may be contraindicated in patients when the general health condition is very poor, which keeps the patient unable to cope with the invasive procedure and may cause delay in healing. Biopsies are also avoided when there is an acute, virulent, pyogenic infection in order to avoid spread of infection. Lesions of vascular origin and those in patients who have a history of blood dyscrasias may complicate the situation. [9] Biopsies may require medical clearance in the case of medically compromised patients. In addition, they may cause iatrogenic worsening of the condition in certain patients. These include patients on radiotherapy, patients in bisphosphonates. Biopsies should also be avoided in patients whose lesions may resolve when allowed a benefit of doubt after removal of any local causative factors. Biopsy at the first visit should be avoided unless the clinician has substantial evidence for suspicion of malignancy or other serious lesion which require mandatory biopsy.[5]

Pros and cons of empirical therapeutic trial versus an immediate biopsy of oral mucosal lesions:

In certain cases of oral mucosal lesions, like vesiculobullous lesions, certain precancerous lesions, infective, traumatic and other inflammatory lesions, a therapeutic trial offers many advantages over immediate biopsy on the first visit. The basic formula for treatment of any disease is accurate diagnosis which would indicate the appropriate treatment plan. But, there are situations where empirical treatment of non-specific lesions on the basis of history, clinical features or a provisional diagnosis may be acceptable or preferable. If the empirical therapy given for a 2-3 week period sufficiently clears the lesion, the biopsy can be avoided. In addition, in precancerous conditions, dysplasia may be present in only localized areas. If these areas are overlooked and other areas biopsied at the initial visit, the diagnosis will be missed. When empirical therapy is given, if the lesion does not respond or if a particular localized area is refractory to treatment, biopsy of the refractory area is more likely to give the correct diagnosis.[10] Certain benign lesions may sometimes bear resemblance to premalignant lesions or even resemble malignancy. The clinician must be aware of the history, clinical features and other features which will help differentiate these conditions. Some clinicians may feel more comfortable having the results of an immediate biopsy before treatment. But, clinically practical patient management favours a therapeutic trial of drugs first and biopsies to be performed for refractory lesions.[11]

On the other hand, a more confident diagnosis and treatment plan can be done when the results of a biopsy

are also used. A biopsy of representative tissue must be obtained when lesions don't adequately respond to a therapeutic trial. Histopathological diagnosis also helps to reassure the patient and helps instill a greater degree of confidence in the treatment modalities. Sometimes, a lesion may heal with a therapeutic trial, and a therapeutic diagnosis may be made. But if the disease recurs, then the clinician is again in a dilemma about the diagnosis. Malignant transformation is also a risk in certain oral mucosal lesions. Due to this possibility, confirmation with a biopsy is a good approach.[12]

Patient preferences and behavior regarding/ following oral biopsies:

Patients' participation in the decision making process is an important part of healthcare. People who are given information about the planned investigations and treatment are usually less anxious. When patients are told that they require a biopsy they are usually concerned about both the procedure and the results. Any invasive/surgical procedure is linked to stressors such as pain, cost of treatment, fear of needles, failure of the surgeon and fear of infectious diseases[13] . So, the decision to perform a biopsy should be based on sound evidence from examination and other investigations in order to avoid putting the patient through unnecessary stress associated with the invasive procedure [14].

Pitfalls and complications associated with a biopsy:

In spite of being the gold standard, histopathology is subjective and results may not accurately represent severity of lesions. Since sample is taken only from a localized area, the results may overdiagnose or underdiagnose the lesion. Histological assessment alone cannot predict the transformation of an oral lesion into a malignancy.[15] Rapid proliferation in a malignant lesion can outgrow the nutrient supply and result in ulceration or necrosis. Similar ulceration, necrosis and epithelial sloughing may be present in vesiculobullous disorders. These lesions can be a challenge when selecting a biopsy site. Palatal and gingival biopsies heal by secondary intention and may cause delayed healing, exposure of denuded bone for several weeks or may result in unesthetic gingival recession and root exposure. Local haemostasis and tissue stabilization can be a challenge in lip biopsies. Improper technique can compromise esthetics. Tongue lesions cause difficulties in stabilization, suturing with increased risk of the wound reopening.[5] Further, lack of correlation between the clinical signs and symptoms and the histological picture may be observed, especially when unrepresentative tissue samples are submitted. Incorrect handling and fixation can induce artefacts and render the tissue non-diagnostic.[16] Meticulous surgical techniques should be used during biopsy procedure to avoid clot disruption, wound dehiscence, and bleeding problems. Some patients may also report paresthesia following biopsy which may last several days to months. [7]

Some lesions where empirical treatment can help avoid immediate invasive biopsy:

Presence of Candida in oral potentially malignant disorders has been researched frequently. The epithelial changes seen in mucosa with a leukoplakic lesion allows Candida to infiltrate and invade the mucosal surface. [17] In addition to its effect on carcinogenesis, Candida in a leukoplakic lesion may also interfere with the histopathological examination and may not provide an exact picture of the degree of dysplasia. An initial exfoliative cytology done to detect the presence of Candida can help to prescribe a topical antifungal agent for an initial period of 2 weeks following which a biopsy can be done. This would provide a more accurate picture.

Oral Lichenoid reactions may be induced by either a systemic medication or topical antigen exposure. Withdrawal of the drug or removal of the triggering agent usually resolves the condition. Lichenoid reactions associated with dental amalgam restorations are very common. Common anatomical sites include the lateral border of tongue and the buccal mucosa which may be in direct contact with the surface of the restorations. The lesion is usually well demarcated and fits the outline of the restoration. They may also be caused by use of systemic medication and substances like cinnamon. [18] Sometimes, the lesion may not exhibit a close topographical relationship and may have similarities to a leukoplakia or erythroplakia. It is therefore essential for the clinician to be familiarized with the individual variations in the clinical presentation of a lichenoid reaction in order to avoid an unnecessary invasive biopsy.

Mucosal ulcerations are common lesions encountered in daily practice. The most common cause of a solitary ulcer is chronic trauma resulting from sharp cusp margins, broken teeth or ill-fitting dentures. Other less common causes include a traumatic ulcerative

granuloma, infections like tuberculosis, late stage of syphilis, fungal infections like histoplasmosis. Some cases may eventually be diagnosed as a squamous cell carcinoma. Usually ulcers of traumatic origin are soft on palpation and may have rolled margins and keratinization in the surrounding mucosa. The lesion may sometimes be firm with indurated margins, thereby mimicking a malignancy. This may be due to continuous trauma or chronicity.[19] But lesions may show a dramatic response when extraction of broken teeth is done or when the probable local causative factor is removed. A period of 2-3 weeks can be given for the chance to heal after elimination of the local factor.

Necrotizing sialometaplasia is a benign self-limiting, inflammatory lesion of the salivary gland tissue where there is squamous metaplasia of the ducts and acini after ischaemic necrosis of the salivary gland lobules, most frequently occurring on the hard palate. Diagnosis is usually based on a thorough and complete clinical history.[20]. It may clinically mimic a malignant ulcer but a history of local trauma like administration of local anaesthetic, ill-fitting dentures, intubation or surgical procedures will be present.[21] Usually the lesion heals by secondary intention in 3-4 weeks. The hassle of an invasive biopsy may be avoided in such cases.

Socket Granuloma / Overhanging Clot occur as post-operative complications 1-3 days following a tooth extraction, usually as a consequence of not following post-operative instructions. They may give the appearance of a proliferative lesion arising from the socket, prompting the clinician to perform a biopsy. An overhanging clot may need to be removed followed by placement of sutures along with local haemostatic measures or it may resolve on its own. The dentist should therefore be familiar with the incidence of post-operative complications and their management.[22]Medication induced oral ulceration like Nicorandil-induced ulceration may appear as a large, deep, persistent ulcer. They are poorly responsive to steroids and only respond to discontinuation or reduction in the dose of the drug. Therefore, careful probing about the history is important to diagnose these cases.[23] Vesiculobullous diseases may cause generalized ulcerations in the oral mucosa. When the history and clinical presentation is “classic”, biopsy can be deferred until a therapeutic trial is given in the initial visits. This could help avoid adverse effects or inducing more ulceration.[10]

Conclusion

This paper highlights some clinical points that could help a clinician to give a good clinical diagnosis based on history and examination before performing an invasive biopsy. If these situations are encountered clinically, the dentist can render invaluable service to the patients with diagnosis and prompt treatment.

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Role of Oral Physicians in Special Care Dentistry

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Abstract

Over 15% of the world's population has some form of disability with 110-190 million people experiencing functional difficulties, which includes people with physical, sensory, intellectual, medical, mental or social impairments. WHO has emphasized the need for oral health care in these patients as they generally have greater levels of oral disease. Poor oral health can complicate the underlying systemic condition and cause deterioration of general health. Dental treatment of people who are medically compromised, disabled or older poses challenges as they might require multiple interventions and are less likely to receive adequate care compared to their apparently normal counterparts. The solution is to have a speciality designed specifically to treat these patients by training professionals in treatment of patients with special needs. Oral Medicine is the speciality concerned with dental and "medical" related disorders of the oro-facial region, including oral manifestations of systemic disease and management of medically complex patients. One of the competencies of an Oral Medicine graduate is the ability to effectively manage patients with medically complex conditions and special needs. Oral Medicine specialists may be considered the best choice for integration with the field of Special Care Dentistry as they have knowledge on medical diseases and their effect on oral health. This paper highlights the need for Special Care Dentistry in the Oral Medicine Curriculum and why Oral physicians are best suited for provision of dental care in this population.

Keywords: *Special Care Dentistry, Oral Medicine, Oral Physician, Special Needs, Medically Compromised.*

Introduction

WHO international classification of Functioning describes "Disability" as an "Umbrella term", which includes impairments, activity limitations and participation restrictions. Disability is diverse and includes any condition that restricts everyday activities, an impairment that may be cognitive, intellectual, physical, mental, and sensory or a combination of the above. Disability rates continue to rise around the world due to the increase in life expectancy, the ageing population and increased likelihood of acquiring chronic diseases.[1] As more people grow older and more retain their teeth, this presents challenges to the dental professionals in providing care to the medically compromised and the multiply disabled. Global oral health goals to be achieved by 2020 by FDI/WHO/IADR have emphasized the importance of promoting oral health in the populations with the greatest disease burden.[2] Although improvements in oral health care have occurred across all sections of the community, disadvantaged and disabled people continue to have the poorest levels of oral health. Oral health in these people as they are often unemployed, earn less, have difficulties in communication, transport and usually depend on caretakers for help and support. So, they may require additional and specific care when compared to the general population. As professionals, we have the responsibility to ensure that the oral health care needs of these people are met and treatment is best when provided by a professional with adequate training in handling patients with special health care needs.[3]

Special Care Dentistry Around the World

"Special care dentistry" (SCD) is concerned with the improvement of oral health of individuals who have physical, sensory, intellectual, mental, medical and emotional or social impairment and a combination of the above. It also includes people with complex health conditions, people under long term hospitalization and critical care and people in residential care units.[4]

As this need for SCD is recognized, we have seen the development of various undergraduate curricula

and postgraduate courses in countries like U.S, Canada, Europe, Oceania and the UK. Dental schools in the UK (Dublin, King's College, Cardiff, Birmingham) conduct workshops and lecture series before students spend time in the departments and it is also required as a part of the curriculum for dental nurses and hygienists, which enables them to participate in provision of dental care for disabled people.[5]

There are a variety of postgraduate programs currently being offered in the UK and Ireland. Bristol University, King's College, London, Eastman Dental institute and Trinity College, Dublin are among the institutions which offer full time and part time courses. The General Dental Council of the UK has formally recognized SCD as a dental speciality in 2008. The United States has founded the American Board of Special Care Dentistry and training programmes have been offered in numerous universities. They also have founded the Special Care Dentistry Association, which is an international organization of oral health professionals who are dedicated to providing and promoting oral health for patients with special oral health care needs. [6, 7] The Australian society for Special Care in Dentistry (ASSCID) has been added as an affiliate professional organization of the Australian Dental Association. Universities in Australia and New Zealand provide postgraduate courses in Special Needs Dentistry and Hospital Dentistry.

According to the 2001 census, 21 million people in India have some form of disability constituting 2% of the world population and 75% of these people are concentrated in the rural areas. A formal organization for treating oral problems of these patients has still not been organized. Collaborative efforts of AIIMS (All India Institute of Medical Sciences) and WHO have recommended actions to be taken by governmental and non-governmental sectors in this issue. SCD as a part of a postgraduate curriculum is a necessity in today's scenario.[8]

Barriers and issues in treating special care dentistry patients

The special needs patients are one of the neediest and most underserved populations in the current scenario in India and other countries. The physical, mental and medical disabilities make it difficult for the patients to visit a dental office and they are also limited in their ability to afford therapeutic and preventive treatment. This is also augmented by the scarcity of dentists that provide appropriate care. A more important factor is dental students not being exposed to caring for the disabled during undergraduate or postgraduate training. Most of the work with disabled persons is estimated to be treatable by general practitioners but the issue here is their little experience in handling these patients.[9]

There are a number of barriers to oral health care for people with special needs that have to be overcome in order to address their needs. Scully et al have classified these barriers as – barriers with reference to the individual which include a lack of perception of need difficulty following instructions and access problems, barriers with reference to the dental profession which include lack of training and a lack of time and resources, societal barriers which include a general lack of awareness and a lack of positive attitudes towards oral health and governmental barriers include a lack of resources for oral health services. [10, 11] Barriers to physical access continue to exist in the form of lack of facilities like ramps for wheelchairs, suitable parking, accessible toilets, hoists or stairlifts.[12] Barriers in communication may be encountered in patients with hearing and/or visual impairment, neurological deficits, psychiatric or cognitive difficulties.[13] Patients with a reduced mental capacity or inability to communicate their decision can also present a challenge while obtaining consent for dental procedures.[14] Dentists are required to work in new ways using extended teams and taking responsibility for educating the team into incorporating a holistic approach to oral health care for each individual with a disability.[5] Certain conditions that might predispose patients to complications or emergency situations (epilepsy, allergies, bleeding disorders, etc) in the dental chair. Ensuring that the dental team knows how to manage such situations can be life-saving.[15]

Value of education in special care dentistry

The lack of dental service available for disabled people is partly because of the reluctance among professional to treat them and most practitioners receive minimal education to prepare them to work with such patients. Having positive attitudes, positive experiences and positive social contact has been shown to improve interest in serving these populations.[16] Dental professional who are trained and willing to care for disabled people are needed. Clinical contact with older and disabled people, positive clinical experiences are essential for students to overcome anxieties and develop

sound management skills.[17] A survey showed that dental practitioners with no contact or experience with treating special needs patients were less likely to care for such patients whereas practitioners who had hands-on educational experiences were less likely to consider disability as obstacles to oral care and were more likely to desire further education in caring for these patients.[18-20] Reports also say that practitioners feel the pressures of time and lack of reimbursements creates disincentives to treat these patients. Practitioners may abstain from treating these patients if they felt that these issues have not been resolved.[21]

Providing necessary education and training for practitioners and students implies the creation of an academic and clinical discipline to provide teaching, training and a career pathway. Development of a discipline may aid in the development of specialist services for patients with complex dental needs. In addition to the UK, US, Canada, Australia and New Zealand, other countries like Japan, the Netherlands, Spain, Argentina and Mexico are in the process of recognizing SCD as a stand-alone speciality.[22]and a large proportion of these persons will require Special Care Dentistry at some point in their lifetime. It is estimated that 90% of people requiring Special Care Dentistry should be able to access treatment in a local, primary care setting. Provision of such primary care is only possible through the education and training of dentists. The literature suggests that it is vital for the dental team to develop the necessary skills and gain experience treating people with special needs in order to ensure access to the provision of oral health care. Education in Special Care Dentistry worldwide might be improved by the development of a recognised academic and clinical discipline and by providing international curricula guidelines based on the International Classification of Functioning, Disability and Health (ICF, WHO In India, there is neither a recognized speciality nor a clear career pathway for dentists to be trained in SCD.

Oral medicine and the potential role of oral physicians in special care dentistry

Dr. Lester Burket, a pioneer in the field of Oral Medicine, considered by many to be the father of this discipline, was one of the first educators to promote the concept of integration of medicine into dental education and clinical practice. Burket's textbook previously defined Oral Medicine as a "speciality within dentistry that focuses on the diagnosis and management of complex diagnostic and medical disorders affecting the mouth and jaws. Clinicians manage oral mucosal disease, salivary gland disorders, facial pain syndromes and also provide dental care for patients with complicating medical disease." The newest edition of Burket's Oral Medicine (2015), as "a specialized discipline within dentistry that focuses on provision of dental care for medically complex patients, diagnosis and management of medical disorders involving the mouth, jaws and salivary glands.[23] The American academy of Oral Medicine has defined Oral Medicine as the discipline of dentistry concerned with the oral health care of medically compromised patients and the diagnosis and non-surgical management of medically related disorders and conditions affecting the maxillofacial region".[24]

Hundreds of medical diseases impact the oral cavity and oral pathological conditions also have an impact on systemic health. Unfortunately in our country lack of access to primary medical / dental care prevents patients from seeking treatment until a negative event or complication has occurred. So the best way is to create awareness among patient and for dental professionals to have a clear understanding of the chronic conditions that affect the oral and systemic health of the patient. Since Oral Medicine is the intersection of medicine and dentistry and a window to the general health of the patient, we may be the best suited among all specialities to provide dental care for medically compromised patients.

The American Academy of Oral Medicine has described clearly defined minimum competencies that are required of all individuals to successfully complete an Oral Medicine Training program. The scope of Oral Medicine was divided into three domains that represent required clinical expertise.

1. Diagnosis and Non surgical management of oral mucosal and salivary gland disorders.

2. Diagnosis and Non surgical Management of temporomandibular disorders, orofacial pain and orofacial neurosensory disorders.

3. Management of medically compromised patients.

So, an Oral Medicine graduate must have a thorough knowledge of how systemic diseases affect oral health and vice versa, and how management may

require modifications of treatment when compared to healthy patients. They must assess wound healing, risk of infection, bleeding risk, medication/drug interactions and behavioural issues. This comprehensive evaluation should be accompanied by diagnostic tests and expert medical consultations when indicated. The clinician will then apply this knowledge to implement modifications that are necessary in delivery of dental treatment.[25-26]

A survey conducted on the Oral Medicine curriculum and training was presented in the World Workshop of Oral Medicine in 2010 which explored the Oral Medicine post graduate training and curricula in 22 countries. Oral Medicine was not a recognized speciality in 8 of these countries and in 9 countries oral medicine is combined with another distinct field of study like Oral Pathology, Oral Radiology or SCD. There was a significant variability of responses regarding the integration of oral medicine with special care dentistry with most agreement from participants from India, Israel, Italy, Spain, Brazil, Canada, USA, UK and Thailand.[27]Oral Medicine and Radiology as a specialty was introduced in India in the year 1971 at the Government Dental College, Bangalore with huge improvements in the practice in the past 46 years. Several recent reviews have discussed the nature and extent of training Oral Medicine graduates and the need to further enhance their curricula. [28] As there is a scarcity of specialists who deal with the active management of dental issues in medically compromised patients and patients with special needs, this could be the right step to include Special Care Dentistry as part of the Oral Medicine curriculum.

Conclusion

Why should Oral Medicine accept a new speciality as its own? As the only speciality at the crossroads of Medicine and Dentistry, we are already positioned to diagnose and treat oral/systemic conditions. Having a unified speciality could be a referral point for the medical fraternity and improve communication. In addition, training in Special Care Dentistry could help bring out robust professionals who are competent in handling patients with disability and provide graduates with better career opportunities.

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Lifestyle Diseases among Girl Child in Urban India

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Abstract

The paper will focus on the problems due to lifestyle in the health status of girl child in urban India. To access lifestyle changes among the girl child, different lifestyle diseases and their impact on health will be emphasized. Lifestyle is an individually constructed behaviour that determines the health and well-being of an individual. Health of the girl child is determined by a wide range of factors like family background, their socialization process, social class, peer group influence and their like. Girl child in urban India is more vulnerable to lifestyle diseases owing to lack of physical activities and improper food habits resulting due to transformation in consumption pattern. As a result, they are susceptible to obesity which leads to health problems in the long run. Besides obesity, lifestyle also develops the risk of other diseases like type-2 diabetics, cardiovascular disease, cancer, etc. In recent years, these diseases have developed a severe public health concern not only among adults but also for children. This study is based on an extensive literature review to identify the evolving problems and significant health risks associated with such diseases. It is observed that the role of media such as television, mobile phone, and access to a computer also play a prominent role in the lifestyle of the girl child. Therefore, this paper also delineates the effect of digital accessories that has changed the preferences and choices of the girl child in multiple ways.

Keywords: *Lifestyle diseases, Girlchild, Urban India, Consumption pattern, Public Health*

Introduction

In the contemporary society, fast production and consumption are some of the critical areas of life that has given rise to into unplanned urbanization and globalization particularly in developing countries[9]. Not surprisingly, this principle of ever advancing social acceleration in developing countries has led to the emergence of non-communicable diseases (NCDs) like cardiovascular disease, cancer, chronic respiratory disease, and diabetics. It is estimated that globally 41 million deaths each year are the result of NCDs where 85% of these premature deaths occur in low and middle-income countries[2]. In a country like India, the incidence of the NCDs has developed stern public health concern not only in the health of adults but also among children[25].

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Girls are particularly more vulnerable to NCDs as in many developing countries they are discriminated in terms of their marriageability which in some societies represents the route for economic and social status. The vulnerability of girl child is also observed in physical mobility which is often associated with diabetics, obesity, cardiovascular disease and certain types of cancer[1].

Various Social Determinants of Health (SDOH) like gender, lifestyle, standard of living, social norms and attitude, geographical location, and culture impact health and well-being of the girl child[4, 32, 13]. SDOH is the condition in which people are born, grow, live, work, and age and the circumstances that are shaped by the distribution of money and resources at global, national and local level. SDOH are responsible for health disparities where unfair differences in health status are seen within and between countries[33]. Interestingly, in the health of girl child, the SDOH like lifestyle, gender, and culture play a prominent role in bringing health disparity[34]. Lifestyle is a crucial SDOH that shape the choices and preferences of the girl child[16]. The

formative years of the girl child stand fundamental in their lifespan as, during this period of the life cycle, lifestyles are formed and hence becomes established where girls become more independent and make their own choices[3,2]. Thus, the objective of this paper is to understand the growing prevalence of lifestyle diseases among girl child resulting due to less physical activity, sedentary lifestyle, and dietary practices.

Methodology

This study is based on secondary data which includes published academic of literature. Therefore, an extensive literature review was conducted for the same. The age group of girl child was chosen between 8-18 years based on literature, the problem concerning lifestyle disease among girl was found within the specified age-group[4,3,22]. The literature search was done on an available public domain such as Google Scholar, Jstor. The keywords used for the search included but not limited to lifestyle and urban children, gender and Social Determinant of Health, technological use and impact on children health. Journals were chosen concerning the health of girl *Journal of Child Health Care*, *Indian Pediatrics, Asia-Pacific Journal of Public Health, Health Promotion International,* etc.

Children Lifestyle and Health

WHO (2019) defines a child to be any person within the age of 19 years or younger. However, a child is also defined to be any human being below 18 years of age unless s/he attends a majority under the prescribed law[35]. Apart from this, childhood is a social construction and not merely a biological fact. It is not only determined by culture but also conceived according to social class, ethnicity, and gender[7]. The sociological understanding of childhood perceives a child as a social actor who reflexively constructs their environment[18]. The social character of childhood is recognized as an essential factor in shaping experiences of the children[15].

Lifestyle, on the other hand, is defined as a set of mediating structure that seeks to reflect upon activities, attitudes, social values, and an array of behavioural patterns depending upon age, education, economic and social factor, among other[36]. It also represents the steady form of personal behaviour where independent choice provides a way to solve social system antagonisms[21]. Lifestyle in the contemporary society is considered to be integrated into the bodily regimens where people have become more responsible for both health and design of their bodies[8]. Moreover, lifestyle pattern of children particularly girl child cannot be characterised by a single entity as it is determined by the range of factors like family background, social class, cultural milieu, and religious affiliation[7]. It is in fact shaped during their childhood that makes a lasting effect in their adult lifestyle and later life [6].

Health, as perceived from the social model, is influenced by various factors like political, economic, social, psychological, cultural, and environmental [5]. WHO (1998, p.1) defines health as a "state of complete physical, mental, spiritual and social well-being and not merely the absence of disease or infirmity." As for the health of girl child is concerned adherence to basic lifestyle behaviour as a result of imposition by the adult member of the society becomes a part of imitation in their early life[21]. Under such conditions identifying the risk of ill health problems can serve as a useful measure to stop the preventable lifestyle-related health problems among girls and for future generations[1]. In most of the situation self-reflection in behaviour patterns among the girl child in adopting healthy lifestyle becomes inherently blurred in the absence of adult control. As a result of which they violate basic principles of a healthy lifestyle in later life[21]. Moreover, failure to act on the problems of NCD will undermine developmental gains that also include progress by recognising the importance of girl child in the contribution to society[1].

Delineating causes of lifestyle diseases among the girl child

NCDs are generated with increased indulgence in a social and physical environment designed to influence the way we work, produce, process, and consume[9]. This advanced level of development and change in structures can be perceived in the consumption patterns and physical inactivities that have ultimately led to epidemiological transition[30]. According to WHO (1996), the epidemiological transition is the condition where a general shift from acute infectious and deficiency disease to chronic NCD become widely visible. India is in the midst of the epidemiological transition due to the emerging conditions of NCDs[23]. Given this background, identifying the factors responsible for rising risk of NCDs becomes essential. Hence, it is of particular significance to investigate causes of NCDs on many counts.

First, in addition to lifestyle as a SDOH, technology has an important role to play in health of a girl child[4].

At one hand technology has been praised for reinforcing educational advancement that has enhanced learning while on the other, it has induced anomie and anti-social behaviour among girls[14]. Prolonged television viewing along with snacking behaviour is allied with the risk for development of overweight among the girl child[10]. Here the risk is presumed in a way where society actively tries to break away from the past to that of a modern system of lifestyle[12]. Lifestyle choices are also shaped by the conditions where girls are not provided with a safe environment due to lack of opportunity[17]. This brings us to analyze the role of gender which is an essential SDOH and their impact on health of the girl child. Cultural differences in terms of gender forbid girls to engage in outdoor play activity as compared to boys. Due to this, they invest their time in watching television or computer which also develops the risk of NCDs among the girl child[4].

Second, advertisements commercialize living standards of the girl child in such a way that the images that are sold through advertisements become the symbols of their childhood[14]. Their childhood is in fact trapped in 'steel-hard' cage where advertisement media are also responsible for reinforcing hegemonic control over the mind of a girl child[9]. However, in India, the pervasive influence of advertisements mainly through audio and visual aids has influenced the dietary pattern of girls[20]. This is for the fact that in India advertisement promotes an unhealthy diet including food that is rich in fat, sodium or added sugar[16,29]. Such kind of shift in food pattern develops the problem of obesity which is not just a physical problem but also a social problem like eating disorder and obsession with body shape[26].

Third, urban settings are mostly associated with lower levels of physical activity as compared to rural settings[1]. Limited space in the cities does not provide an adequate and safe environment due to which the girls are sequestered in their home thereby focusing on the use of television or computer[28]. SDOH like gender also plays a significant role in bringing health differences among the girl child where interests on sports are emphasized among the boys as compared to the girls[28]. Moreover, despite the involvement of girl child in activities like walking and cycling, the overprotective nature of the parents often restrict them from such physical activities[19]. Therefore, the above factors show the susceptibility of girl child in urban areas. Under such circumstances, an interactive approach through intensive and repetitive intervention can serve as an effective pillar in preventing NCDs among the girl child[24].

Discussion and Conclusion

The UNCRC (1989) recognises the right of every child to self-determination, dignity, respect, non-interference, and the right to make an informed decision. UNICEF (2003) claimed that 'World Fit for Children' will only be accomplished with full participation of children and young people. Children's participation in research should advocate in understanding their needs to determine health literacy capacities across diverse communities by adopting a child-centred approach in research. Ironically, the active involvement of children in the study is not acknowledged in academic discourse [27].

In addition to this, the development of the curriculum should be such that it resonates with the experiences of children in terms of both media and health[37]. SDOH like gender and lifestyle should also be addressed by focusing on the gender-responsive health system to provide adequate attention to gender needs and priorities[1]. In the Indian context, awareness among the parents in making right choices in food and physical activity should be internalized as they play an active role in the socialization process. Their role in addressing purchasing power and choices relating to food should also be discussed to minimise the health consequences[26].

Moreover, in India understanding the problems of lifestyle diseases among the girl child is a national concern. It is because problems associated with the NCD are emerging at a time when undernutrition is still a significant public health concern[13].

Besides, not many studies have specifically provided insight into the health of a girl child. Furthermore, studies related to the problem of NCDs in India correlates with affluence while it is also prevalent among children belonging to the middle-income group. Therefore, to elude the risk of NCDs, empowerment and equal access to knowledge and resources should be emphasized through interventional programme. Such programme can assist policymakers in reducing the growing problems of risks associated with lifestyle among girl child.

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Effect of Core Training with and without Yogic Practices on Elasticity among College Female Athletes

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Abstract

The present study evaluates the impact of core strength training with and without yogic practices on elasticity among the college female athletes. To attain the aim of the study forty five (N=45) female students were selected randomly as subjects from Chennai, Tamilnadu, India aged between 17 to 25 years at random. The athletes were separated into groups of three with 15 students each named as experimental group I with core strength training , experimental group II with core strength training with yogic practices and group - III with controlled training. Prior to and after the twelve weeks of experimentation, the subjects were tested. The core strength training and the yogic practices were selected as training protocol. The core strength training given based on stress given in each exercise and sets and the load administered between 5 and 10 repetitions in a set with the time lapse of 15 to 10 seconds for a set. The training protocol followed by proper warming up and cooling down regime. The yogic practice was given on morning time with proper prayer and warming up practice. The load of the yogic practice increased by the number of yogic practices by 2 to 8 repetitions with 2 to 5 sets. The obtained data from the experimental and control group initial and final readings underwent statistical analysis along with analysis of covariance (ANCOVA) with the application of Scheffe's post hoc test to examine the groups' difference and testing condition. The level of confidence had a fixation of 0.05 confidence level. The group that acted as the experimental group had improved significantly on flexibility in comparison with control group.

Keywords*: Core strength training, Yogic practice, Female Athletes, Flexibility.*

Introduction

The spine, hips, pelvis, lower limb at the proximal level and structures in the abdomen which forms the musculoskeletal core of the body are responsible for stabilizing spine and pelvis. During the sports activities of a person, they help in the energy transformation between the large and small parts of the body.[1] Thoracic lumbar fascia, abdominals, hip girdle musculature, para spinals, hip joints, diaphragm, pelvic floor and spine have a central location as core muscles. They perform the required stabilising functions of the body for the distal segments to do their functions specifically. Also they provide proximal stability of the limbs for their distal mobilization and function. Along with these functions, the core activity is involved with the activities that are limited, for example agility, kicking, throwing etc.[2]

A wide practice of core strength training is undergone by professionals. It aims to develop core stability and improve core muscular strength leading to the improvement of the performance of the athletes. Core strength training is considered as an element of strength and conditioning by the professionals of health and fitness as it enhances the performance of the athletes and prevents injuries. [3] But few studies failed to show the significance of changes in the lower extremity stability or performance. However, further studies are needed to transform core strength training to performance. Scientific studies that are limited were done to evaluate the effect of core strength training on the stability of lower extremity and the performance of the athletes. [4]

The practice of Yogasana includes stretching, moving and holding the body of an individual into various positions comfortably. This improves the muscle

flexibility, where the positions are believed by many practitioners. It helps in the maintenance of the balance of varied internal glands and organs of the body. Hence, the study examines the effect of yogasana exercise that may influence the significant changes in the flexibility on experimental group.

Yoga is considered as the discipline of psycho-somatic-spiritual being that helps in the unity and peace of our mind, body and soul. It also helps in the unity of consciousness of an individual eventually with the universe.[5] It allows a person to synchronize with breathing through meditation and relaxation with a body technique. Yoga is one of the most effective methods, by which the perfection of the latent potentialities, partially expressed in man is attained. Perfection is not an addition – addition of capacities or it is the manifestation of those potentialities which are inherent in man and which lie idol until and efforts is made to bring them to the surface. Jnana, Bhakti, Karma and Raja are the several means to attain the perfection of personality.[6] Flexibility can also be called the capacity for joint movements fluidly through its complete motion. It is the capability of a person to move a part or body parts with a variety of purposeful movements at the speed required. It helps in joint movements with a normal variety of motion devoid of undue stress to the muscular tendinous unit. [7] Flexibility has important interrelationship with other performance factors. The traction of anteflexion, skin among the two fixed points in the midline of the back was tested for the ante flexibility of the lumbar spine. The mark in the beginning was positioned on the process of spine LV, set up by the` intersection of the midline in the dorsal region with the connecting line of both lateral lumbar fossae.

Active flexibility is also of two types – static and dynamic. Static flexibility is required for movement done while individual is in the static state i.e. standing, sitting or lying. Dynamic flexibility is required for executing movement with greater range when individual is moving. Active flexibility is always less than the passive flexibility. [8] The dynamic flexibility is always less than static flexibility and is heavily dependent on the motor coordination. The terms general & specific flexibility are also commonly used to denote the levels of flexibility of all the important joints of the body specifically shoulder, hip & trunk whereas special flexibility is the ability to do movements of a sport with greater range. As stated earlier flexibility is largely depend upon anatomical structure of the joint. The manner in which the bone ends are joined each other basically decides the type of movements possible in the joint. Greater mobility is in ball and socket joint. The elasticity of ligaments can be increased up to some extent by training, but length of the ligaments can't be change by training.

There are very few studies, which are measuring effect of core stability training with and without yogic practices on flexibility in female athletes. Hence there is need to analyse the influence of core stability training with and without yogic practices on flexibility among female athletes.

Statement of the problem

The research aims to assess the impact of core strength training with and without yogic practices on elasticity among college female athletes.

Methodology

To attain the aim of the study forty five (N=45) female athletes were selected randomly as subjects from Chennai city, Tamilnadu, India aged between 17 and 25 years at random. The athletes were divided into groups of three with 15 each named as selected experimental group I with core strength training, experimental group II with core strength training with yogic practices and group - III controlled . The athletes were tested before and after the twelve weeks of experimentation. The core strength training and the yogic practices were selected as training protocol. The core strength training given based on stress given in each exercise and sets and the load administered between 5 and 10 repetitions in a set with the time lapse of 15 to 10 seconds for a set. The training protocol followed by proper warming up and cooling down regime. The yogic practice was given on morning time with proper prayer and warming up practice. The load of the yogic practice increased by the number of yogic practices by 2 to 8 repetitions with 2 to 5 sets. The core training protocol are Crunches, Decline Crunch, Cable Crunch, Oblique Crunches, Jack knife Sit-Up, Barbell Side Bend, Leg lift, Leg lift - Hang Position , Oblique Leg lift and yogic practices protocol are Suryanamaskar. Tadasana, Trikonasana, Paschimottanasana, Chakrasana, Bhujangasana, Nadi Sodhana, Bhastrika and Kapalapathi. The criterion variables measured by using sit and reach based test. The obtained data from the experimental and control group initial and final readings underwent statistical analysis with ANCOVA and Scheffe's post hoc test to examine the groups difference and testing condition. The

confidence level is fixed at 0.05. The statistical analysis computed with IBM-SPSS – v21 software.

Results and Discussions

Table – I: The descriptive analysis of experimental and control group on flexibility

Test		Core Strength Training group	Core Strength Training with Yogic practice group	Control Group
Pre Test	Mean	21.20	22.30	22.35
	SD	0.86	0.58	1.45
Post Test	Mean	25.45	28.56	22.56
	SD	0.86	1.25	1.02
Adjusted Post Test	Mean	25.78	28.89	23.45
Magnitude of Improvement		17.76%	21.66%	4.69%

Table – II: ANCOVA on flexibility among groups

Test	Sum of Squares	Df	Mean Square	F	'P' Value
Pre Test	8.01	2	4.00	3.07	0.065
	54.62	42	1.30		
Post Test	135.25	2	67.62	44.48*	0.000
	64.20	42	1.52		
Adjusted Post Test	136.89	2	68.44	44.15*	0.000
	63.58	41	1.55		

*Significant at 0.05 level of confidence

TABLE-III: Scheffe's post hoc test of paired mean difference on flexibility

Core Strength Training group	Core Strength Training with Yogic practice group	Control Group	Mean Difference	'P' Value
25.78	28.89	-	3.11*	0.000
25.78	-	23.45	2.33*	0.000
-	28.89	23.45	3.44*	0.000

*Significant at 0.05 level of confidence

The results in table I-III on flexibility were similar before the training programme. The post test found significant among the groups on the chosen criterion variables. Further, the Scheffe's post test showed that the adjusted post test paired mean differences on flexibility between core strength training and training of core strength with yoga, core strength training and control groups and core strength training with yoga

training groups and control group found significant with the P value 0.000. Hence, the results show that the flexibility in the training with core strength along with yoga training groups and core strength training groups improved significantly. The control group have shown insignificant on flexibility. The data is represented graphically in Figure I and II.

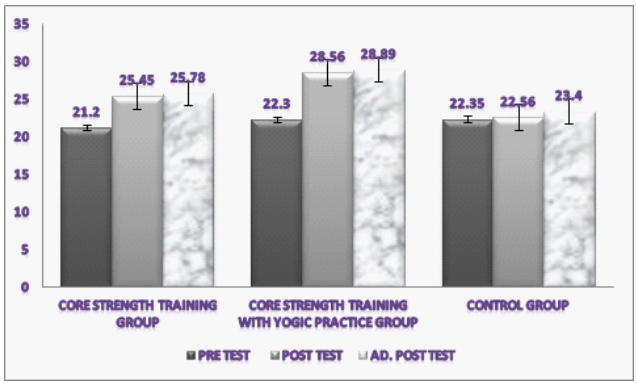

Figure I: The graphical presentation of data of descriptive statistics on flexibility

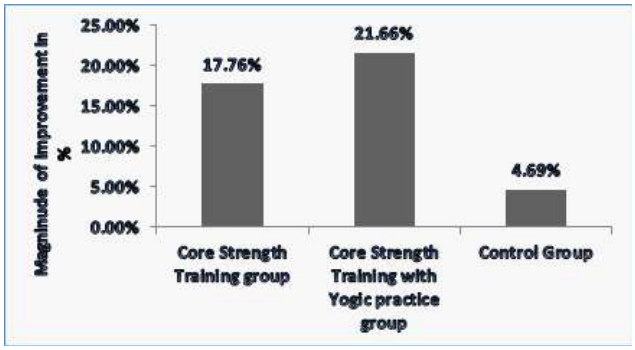

Figure II: The graphical presentation of magnitude of improvement from the initial to final means on flexibility

Discussion on Findings

Most of the previous research confirmed the finding of the present study. It is apparent that core strength training and yogic practices is very specific to the flexibility. No well established was observed on the independent effects of aerobic training on flexibility. Two previous studies showed no improvement on flexibility through the aerobic training**.** [9] Without the inclusion of the stretching based exercises in the training schedule there was no development in the flexibility with land- or water-related aerobic training. The present study which involves the yogasana exercises improved the flexion and extension of the hip.[10] The reason is the increase of the strength of muscle and collagen in the region of lower limbs. [11] However, this research also supports the present study to derive the better training programme. In our study, we found that 12 weeks of yogasana training at medium intensity significantly improves lumbar flexibility in obese females. Study done by Stanton, R et al[1] observed the impact of Swiss ball based training for 6-week on running economy and core stability. in an athletic population. After giving core stability training program in improving function mobility as above study. Core stability extensively benefits the sport performance with a foundation for extensive force production in the upper and lower level of extremity.

Conclusions

The conclusion based on the result and discussions that the flexibility has improved both the experimental groups such as core strength with yogic practice group and core strength training group, in comparison with the control group. Further, the core strength with yogic practice group shows better improvement on flexibility when compare with isolated core strength training group on flexibility.

Ethical Clearance- Nil

Source of Funding- Self

Conflict of Interest- Nil

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A Study on Impact of Environmental Pollution on Health in Referance to Tuticorin Industrial Town, Tamil Nadu

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Abstract

The paper highlights impact of environmental pollution on Health. The present study has been taken up in Tuticorin industrial town area. Major industries numbering 12 established in the district. They are engaged in the production of cotton, staple yarn, caustic soda, PVC Resin, fertilizers, soda ash, carbon-di-oxide gas in liquid etc., The important major industries are sterlite, SPIC, Tuticorin Alkali Chemicals, Dharangadhra chemicals work, Madura coats, Kilburn chemicals industries. The public sector undertakings are the Thermal power unit (620mm), Heavy water plant, and port trust. The district contributes 70% of the total salt production of Tamil Nadu and meets 30% of salt requirement of our country. Aside from deficiencies in the life support system, men is subjected to a variety of environmental Hazards. Some of these are natural, but increasingly environmental hazards result from man's activities and numbers. Sometimes manmade hazards are direct in their impact on other man. But they may be indirect in their influence, acting through other biological systems or overburdening the capacity of natural systems for renewal, dispersion, or assimilation. The following factors can be used in categorizing environmental hazards. (1) Biological (2) Chemical (3) Physical (4) Psychological and (5) Sociological. Hence more than 12 major industries have established in and around Tuticorin. This becomes one of the source of air pollution, water pollution, Noice pollution, in this area. Air pollution may be broadly defined as the presence of one or more contaminants like dust, smoke, must and odour. The atmosphere which are injurious to human beings, plants and animals which unreasonably interfere with the comfortable enjoyment of life or property. Air pollution seriously damages human beings.

Keywords: *Environmental pollution, Health Problems in India, Impact on Pollution.*

Introduction

Environmental sociology in the study of the reciprocal interaction between the physical environment, social organization, and social behaviour. Within this approach, environment encompasses all physical and material bases of life in a scale ranging from the most micro level to the biosphere. An important development of this sub discipline was the shift from a sociology of Environment to an Environmental sociology while the farmer refers to the study of environmental issue through the lands of traditional sociology, the later encompasses the societal environmental relations[1].

A major challenge for the 21st Century is not the creation of wealth, but the management of health. Concern over the rapid depletion and degradation of the World's biological resources and the implications of this loss on the global biosphere and human welfare have been mounting in recent years. Loss and modification of ecosystems and habitats are occurring at an alarming rate, although it is much difficult to quantity or estimate on a global scale. The continuing loss of the biological wealth may leave us with a smaller and less 'varied' stock of global biological resources. The result may leave the human livelihood and the future of the biosphere at risk. Development efforts along with modern warfare have created an uneasy and irreparable environmental consequences, the world over[2]. Human life and health are at great jeopardy and the burden of diseases and ill health raise questions on the development efforts in the pursuit of global prosperity and wealth.

The environmental pollution and degradation may rise in step with such a rise in output, the result leading to an appalling environmental pollution and damage. Tens

of millions more people may become sick or die each year from environmental causes. Water shortages may become intolerable and tropical forests and other natural habitats may decline to a fraction of their current size. The earth's 'sources' are limited and so is the absorptive capacity of its 'sinks'. Whether these limitations will hinder the growth of human activity will depend on the scope for substitution, technical progress and structural change[3].

Environmental Health in India

Environmental health can be defined as "the aspect of public health that is with all external conditions such as all forms life, substances, forces, problems and challenges and any other condition in the surroundings of man that that may extent an influence on man's health and well-being". Disease in this sense represents maladjustment of the human being to his environment. This rapid industrial growth has made water pollution, air pollution, and hazardous wastes pressing environmental problems in many areas of the developing world. Industrial emission's combine with vehicle exhausts to cause air pollution, while concentrations of heavy metals and ammonia loads are often high enough to cause major fish kills down- River from industrial areas. The lack of hazardous waste facilities compounds the problem with industrial wastes[4].

The physical environment has a major influence on human health not only through temperature, precipitation and composition of air and water but also through its interaction with the type and distribution of the flora and fauna (the biological environment). The biological environment is a major influence on the food supply and on the reservoirs and transmission mechanisms of, many diseases. The following gives the simplified illustration of these relationships.

The scale and nature of human activities including agricultural, industrial, and energy production, the use and management of water and wastes, urbanization, the distribution of income and assets within and between countries, the quality of health and other public services and the extent of protection of the living, working, and natural environment.

Environmental hazards to health fall into two broad categories. On the one side is the lack of accessibility to basic environmental resources like sanitation, water, fresh air, shelter and the like. On the other side is the exposure to hazardous environment. These hazards include biological agents viz., micro-organisms such as bacteria and viruses and parasites which contribute to the global burden of infectious disease, chemical pollutants, ultra violet radiation and the like which cause birth defects and damage the body immunity system and which render people susceptible' to a variety of health risks[5].

Table: 1: Statement Showing That General Environmental Problems

S.N	Environmental Problem	Effect on Health
1	Water pollution and water scarcity	More than 2 million deaths and billions of illnesses a year attributable to pollution, poor household hygiene and added health risks caused by water scarcity.
2	Air pollution	Many acute and chronic health impacts excessive matter levels arc responsible for 300, 00 - 70, 0,000 premature deaths annually and for half of childhood chronic diseases; women and children in poor rural areas affected by smoky indoor air.
3	Atmospheric disasters	Possible shifts in vector-borne diseases; risks climatic natural: diseases attributable to ozone changes depletion (perhaps 300,000 additional cases of skin cancer a year worldwide; 1.7 (million cases of cataracts).

Source: Report of Indian public health organization

Among the environmentally-based diseases water, food and oil borne diseases affect a majority of the world population. Diarrohea, Cholera and Hepahtis A and E have the clearest link to the environment and spread by both bacteria and virus.

According to a study, Diarrohea deaths were around 2.5 million in 1996. Around 4 billion cases of diarrohea

cause widespread debilitations each year. The nuclear development and use, the world over is a major threat to human health today. The radiation hazard arising from Extra Low Frequency (ELF) magnetic fields of between one and one hundred hertz (HZ) as well as the very High frequency fields of 147 MHZ, which can alter the outflow of calcium ions from the brain tissue of children, in particular with steadily weakening resistance causes tumour formation in the human body. Health is a fundamental resource to individual and community and is a pre-requisite for their social, spiritual and physical well-being, the protection and preservation of which is dependent on the ecological status of the environment and sustainable development.

Objectives

The following objectives are framed for the purpose of the present study:

- To study the socio-economic life of the respondents in Tuticorin town.
- To analyse the problems of environment in the study area.
- To find out the defects and problems in the existing environment hygiene and discomfort at their life.

Methodology

This study attempts to examine the respondents' behaviour on environmental hygiene and sanitation practices by making an experiment in Tuticorin town, Tamil Nadu. This study deals with environmental hygiene issues relating to environmental pollution and its impact on land, water, health etc., this study analyses the extent to which urban people have knowledge of environment and awareness. It analyses their behaviour on environmental conservation and preservation. It outlines the respondents' awareness of various environmental hygiene and sanitation issues and measures.

It is generally an exploratory framework of identifying the awareness of among urban people about environmental issues along with their action oriented activities to preserve and conserve rural environment in particular. Thus, this study is partlyexploratory in nature. Thus it constitutes the analytical aspect of the study. Hence, this study is partly exploratory in nature and partly analytical in nature.

Limitations

The findings of this study are applicable on to selected areas only mid it is not applicable to the entire areas of Tuticorin. This study covers only environment related aspects and studying of all aspects of hygiene and sanitation is not possible at the level of an individual researcher due to constraints imposed by money, time, energy and efforts.

Results and Discussion

The actual process of research findings, data analysis, data interpretation and logical arguments are discussed. This chapter starts with the socioeconomic background of the households followed by information seeking behaviour, information use pattern, information sharing behaviour, and data search behaviour and so on for statistical analysis. All tabular data and statistical analysis are presented in this chapter.

Table: 2: Sex wise distribution of the respondents

S. No.	Sex	No. of Respondents	Per cent
1	MALE	301	75.25
2	FEMALE	99	24.75
Total		100	100

Source: primary data

The above table shows that the majority 301 (75.25 %) of the respondents were male, the remaining 99 (24.75%) of them were female. It inference that the majority of the male were ready to replay for the problem of environmental pollution.

Table: 3: Impact of Environmental Pollution

S. N	Name of the Disease	No. of Respondents	Per cent
1	Skin diseases	371	93.00
2	Eye irritation	380	95.00
3	Asthuma	153	38.00
4	Deftness	298	75.00
5	Allergy	312	78.00
6	Unhygienic conditions	390	98.00
7	Respiratory problems	393	98.00
8	Cancer	09	2.00
9	Hypertension	91	23.00

Source: primary data

The above table prove the impact of environmental pollution an account of establishment of hazard industry such as Kilburn chemical industries, Sterlite Copper Plant, Thermal power plant, Spic Industries, Heavy Water Plant and Madura Coats, in this regard they replayed that an account of the establishment of the above hazardous industries, the majority 371 of the respondents faced the problems of skin diseases, 380 of them were facing the problem of eye irritation, 153, of the faced the problem of Asthuma 298 of them were facing the problem of deftness 312 of them facing the problem of allergy, 390 of the facing the problems of unhygienic conditions, 393 of the facing problem of respiratory problem, 9 of the were facing the problem of cancer and 91 of them were facing the problem of hypertension.

The inference drawn from above discussion is that the majority of the respondents facing the problem likes in diseases, eye irritation, deftness, allergy, unhygienic condition respiratory problems and diarriah.

Conclusion

Industrial disposals and other chemical contaminates that enter waterways through agricultural runoff, storm water drains, and industrial discharges may persist in the environment for long periods and be transported by water or air over long distances. They disturbed the function of the endocrine system, resulting in reproductive, developmental, and behavioral problems. The endocrine disrupters reduced the fertility and increased the occurrence of still births, birth defects, and hormonally dependent Cancers such as breast, testicular, and prostate cancers. The effects on the developing nervous system can include impaired mental and psychomotor development, as well as cognitive impairment and behavior abnormalities and pharmaceuticals such as antibiotics and synthetic sex hormones from contraceptives. The GOs and NGOs should take effective steps to clean and green the streets, schools, public safety, etc. Even though it's obvious that society stands to benefit from such things, people have always struggled to find some sensible, acceptable way to pay for them. This perennial wrangle. Far on the right, they tell us that self-interested private ownership is the fairest and most efficient way to assign resources[6].

The developing countries like India should be instrumental in raising societal concerns about environmental problems. The scientists should contribute in ways to increasing scientific input in public policy. The governmental agencies, as members of organized scientific bodies such as the National

Academy of Sciences, and as researchers in universities and environmental nongovernmental organizations or, conversely, in industries. There are some debates about whether too much or too little science is reflected in actual policy making, few will deny that significant human and institutional resources are expended in an effort to make scientific analyses responsive to policy needs. Therefore, an appropriate forum like scientists, academicians, policy makers and panchayat raj institutions should take effective step to protect environment in all aspects[7].

Ethical Clearance: Completed (Annamalai University, Vels University)

Source of Funding: Self

Conflict of Interest : NIL

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Seasonal Variation and Malaria in Endemic Mangalore City in South India

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Abstract

Background: In the year 2017 India has contributed to 4% of global malaria cases and Mangalore is endemic to malaria. Malaria transmission also depends on the season of the year, i.e. the wet or dry season. Regardless of huge endemicity and massive health burden, at present limited data has been documented on malaria prevalence and factors contributing to prevalence of malaria and its association with seasonal factors in Mangalore region.

Objective: To study the seasonal variations in malaria burden and species prevalence in Mangalore.

Settings and Design: This is a cross-sectional study conducted at District hospital

Methods and Material: Patients with microscopically confirmed malaria attending the District hospital were included in the study. Demographic details were collected from participants.

Statistical analysis used: Descriptive statistics

Results: In this region malaria is present all around the year and *Plasmodium vivax* is more predominant than *Plasmodium falciparum*. The number of cases peaks during the rainy season suggesting that high rains provide an ideal environment for malaria transmission.

Conclusions: A complex relationship exists between rainfall, temperature, occupation and malaria. Implementing malaria elimination interventions such as preventing water clogging, cleaning the water bodies and increasing awareness for use of prevention practices might help in reducing malaria burden in Mangalore.

Keywords: *Malaria, Infectious disease, Public Health, Mangalore, India*

Introduction

According to the WHO there were 219 million cases and 4,35,000 deaths due to malaria worldwide in 2017. Though most of the malaria burden is in the African countries, a considerable number of cases are reported from South-East Asia, where, India accounts for the highest malaria burden of around 70%.[1]

The National Malaria Control Program launched in 1953 resulted in a decrease of malaria cases to lower than 50,000 in mid-sixties. However, after its near eradication malaria staged a dramatic comeback with nearly 2 million recorded cases every year since 1995 and a clear change in malaria epidemiology: an increase in insecticide resistance, rise in proportions of *Plasmodium falciparum* malaria and rise in urban

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malaria[2]. Between 2010 to 2014, annually there have been 7–16 lakh confirmed cases of malaria and 400-1,000 deaths.[3] In the year 2017 India has contributed to 4% of the global malaria cases.[1]

Malaria was unknown in the coastal city of Mangalore till 1990 but as a consequence of industrialization and urban development it has become endemic in the recent times.[4]

Despite the endemicity and health burden, limited data has been documented on malaria prevalence, contributing factors and its association with seasonal variations in Mangalore region.

Objective: The purpose of this study was to evaluate the seasonal variations in malaria burden and species prevalence in Mangalore.

Materials and Method

Study area: Mangalore is located 12.91°N, 74.85°E on the shores of Arabian Sea in Dakshina Kannada district, Karnataka, South India. Mangalore city has hot and humid tropical climate with two seasons, rainy and summer. The climate of the city makes it a perfect place for breeding of *Anopheles* species and malaria transmission, thus making the city highly endemic to malaria.

Study Setting: Wenlock District hospital, a tertiary care centre

Study design: A cross-sectional study was carried out among patients attending the malaria clinic. Giemsa-stained thick and thin blood smear examination was done and confirmed cases of malaria were recruited in the study. Demographic details were collected from the participants.

Study duration: The study was carried out for a period of one year from January 2017 to December 2017.

Ethical considerations: The study was started after getting permission from the Institutional Ethics Committee, Kasturba Medical College, Mangalore, India. Written informed consent was taken from all the participants.

Results

Data was collected from 1095 consecutive patients with confirmed malaria. Table 1 depicts the demographic details of the participants. The mean age was 32 years. Males outnumbered females presenting to the hospital.

Table 1: Demographic details of Participants

Mean age (± SD)	**32 (±12) years**
Males	1038
Females	57
Occupation	
Construction workers	411
Labourers	154
Hotel workers	145
Others*	385

*Others included security guards, police personnel, bus drivers and conductors, businessmen, fishermen, students, homemakers, retired people

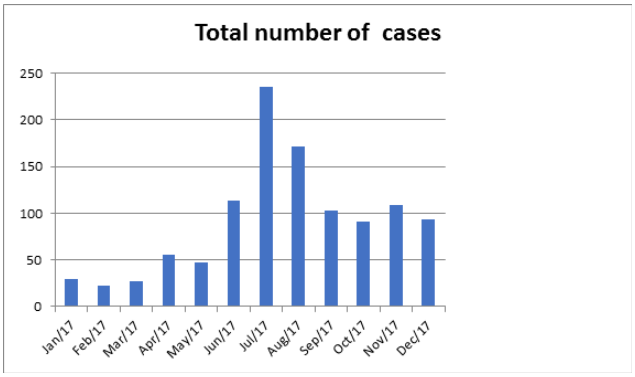

Figure 1 - Summary of total number of smear positive malaria cases and the average temperature every month (2017)

Figure 1 shows the total number of microscopically positive cases of malaria every month and average temperature in the year 2017.[5] This shows that highest number of cases were recorded during the peak rainy season during July and August. The highest recorded temperature during the year is in April and May at around 33 °C while later the temperature gradually reduces to 26 °C in December. During the dry season, though the cases reduced, it was still substantial in number.

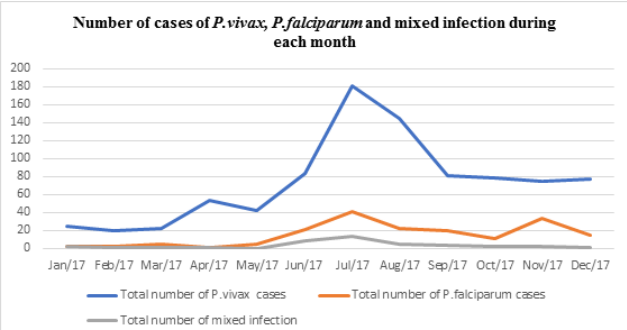

Figure 2-Month-wise distribution of *P.vivax, P.falciparum* and mixed infection cases

Figure 2 depicts the number of cases of *P.vivax, P.falciparum* and mixed infection during every month. *P.vivax* was found in highest number followed by *P.falciparum* and mixed infection.

Discussion

Malaria is a grave health problem in certain parts of India and Mangalore city is known to be endemic to malaria. In the present study the ratio of *P.vivax, P.falciparum* and mixed infections was 81%, 16 % and 3% respectively. The results found in our study are similar to results published in the study conducted by Dayanand KK et al[6].The data recorded by District Vector Borne Disease Control Programme (DVBDCP) office of Dakshina Kannada has shown 80% of malaria cases were by caused by *P.vivax* and 20% cases were by caused by *P.falciparum* which is compatible with results found in our study.[4,7]

The total of malaria cases in the year 2013 in Mangalore was 4714 which drastically increased to 11021 in 2015 and 11037 in 2016 which has now reduced to 8075 in the year 2017 and to 6110 in the year 2018.[4]Thus the decrease in number of cases suggests the success NVBDCP's strategies to reduce the cases. The framework for malaria elimination in India (2016–2030) launched by the government of India in 2016 also aims to control and eradicate malaria.[8]In the year 2018 the number of cases has reduced, and the deaths has drastically reduced to only 85.[3]

In various other endemic regions in the world including Africa, malaria usually affects younger age groups mainly children.[9]In Mangalore the majority of the cases with malaria are adults. It is similar with other cities in India and South East Asia. A high number of study participants were construction workers and labourers leading to skewing of the gender ratio towards males. Majority of the construction workers stay in and around the construction sites. These sites have stagnant water used for curing concrete and construction related activities making it an ideal breeding site for the *Anopheles* species. Lack of prevention methods like bed net use and mosquito sprays is putting these workers at a higher risk of malaria. Additionally, limited prevention practices against malaria is one the major factor for the high number of malaria cases as found by these studies[10,11].

Climatic conditions such as rainfall, temperature and humidity affect mosquito survival and malaria transmission rates. In various places the transmission is seasonal and usually peaks during and after the rainy season. The present study shows that there is a strong relationship between rainfall and malaria. Mangalore during the monsoon season from May to October receives an annual average of 3479 mm rainfall[12]. The number of cases peaked between June to August suggesting that high rains provide an ideal environment for malaria transmission. There was a decline in cases during the dry seasons. In the month of July even though the temperature was 32 °C the highest number of cases, 10 times more than number of cases during February was recorded, as in drier months when the weather is hot the breeding sites of the mosquitoes are dried, and the number of cases reaches low.

Both, *Plasmodium* parasite and *Anopheles* mosquitoes are known to be temperature sensitive. The optimal temperature for most of the *Anopheles* species is in the range of 20°C to 30°C.[13]

Mangalore has the optimum temperature throughout the year. Hence malaria is present in the city throughout the year. *P.vivax* predominates as the causative agent in urban malaria. In Mangalore too, the highest burden of malaria is caused by *P.vivax*. Both *P.vivax* and *P.falciparum* are present all around the year. *P.vivax* is in higher ratio of about 80% throughout the year compared to *P.falciparum*. In comparison, in other parts of the country like in Orissa *P.falciparum* is more predominant than *P.vivax;* in Tamil Nadu it is again *P.vivax* and in the west it is mixed species infections which are more prevalent.

P.vivax has the potential to act as a hypnozoite reservoir and cause multiple relapses leading to an increased burden. *P.vivax* which was earlier considered to be a benign form of malaria is now being found to be not so benign thus making it an issue of concern.

Conclusion: In summary high transmission is found in Mangalore area. The results depicted here show a complex relationship between rainfall, temperature, occupation and malaria cases. The results of this study will be useful for malaria elimination control program of India. Implementing malaria elimination interventions such as preventing water clogging, cleaning the water bodies etc and increasing awareness for use of prevention practices might help in reducing malaria burden in Mangalore.

Recommendation Malaria is a huge health burden in Mangalore. It has been found that the number of cases generally peaks with the rainy season. Thus, awareness and malaria preventive measures have to be concentrated mainly before and during the rainy season during which the number of cases are higher. We also found that the construction workers are mainly affected by malaria. Hence the results may help in targeting a seasonally focused malaria interventions to specific target population like construction workers. Further strategies have to be developed to create public awareness mainly among the construction workers and implement protective measures to reduce the risk of transmission.

Limitation of the study There are a few limitations in our study. Firstly, since it is a hospital based study it doesn't depict the exact picture of overall cases of malaria in Mangalore. Secondly, the study period is one year which is a little short to study the prevalence trends. Thirdly, doing a community based study would give clearer insight of seasonal variation.

Relevance of the study In Mangalore, malaria is highly endemic and a huge health burden to the society. Despite this, very limited data has been documented regarding the malaria cases, contributing factors and its association with seasonal variations in Mangalore region. This study depicts that in Mangalore a complex relationship exists between rainfall, temperature, occupation and malaria and further adds to the scientific evidence.

Conflict of Interest: NIL

Source of Funding: This study is a part of project funded by Women Scientist Scheme- A, Department of Science and Technology (Government of India) file number SR/WOS-A/LS-523/2016

Ethical Considerations: The study was started after getting permission from the Institutional Ethics Committee, Kasturba Medcial College, Mangalore, India (IEC KMC MLR 06-15/126). Written informed consent was taken from all the participants.

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A Study to Assess the Level of Burden and Coping Strategies among Caregivers of Patient with Affective Disorders at Selected Hospitals of Sangli, Miraj, Kupwad Corporation Area

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Abstract

Introduction Interactions with caregivers of patients with severe mental illness like schizophrenia and bipolar affective disorder have revealed negative feelings about the disability status of their relative and burden related to caring for their relative with mental illness. Many caregivers have expressed that the patient‘s disability status affects the family pattern, roles of family members, prosperity of the family and relationship among the family members. Patient outcome and compliance with treatment are also dependent on optimal care giving and addressing family‘s needs. Unfortunately these needs are not routinely considered, addressed or met. Addressing the burden perceived by caregiver and improving their coping can assist with good clinical care of patients with severe mental illness and hence these study to assess the burden perceived by caregiver and their coping.[1] **Objectives**: To assess the levels of Burden among care givers of patients with affective disorders and To assess the coping strategies among the caregivers of patients with affective disorders. **Materials and Method:** The researcher used quantitative research approach to assess burden and coping strategies. The research design was descriptive research design. The tool reliability coefficient ‘r’ of the scale was 0.7, hence it was found reliable. Total 120 samples were selected by non Probability convenient sampling technique. Total two scale namely Zarit burden interview and Rating scale for assessing coping strategies to collect data. The conceptual framework adopted is Sr.Calista Roy’s adaptation model (1984) the main concept of this conceptual framework is human being, stimuli, adaptation models and nursing. **Results and Conclusion:** In this study found the level burden among the care givers of affective disorders patients have experienced 60(50%)were had moderate to severe level of burden,29(24.17%) were had severe burden, 13(10.83) were had no or little burden and 18(15%) were had mild to moderate burden and levels of coping strategies among care givers, 19(15.83%) were had moderately adequate coping strategies, 93(77.50%) were had adequate coping strategies and 08(6.67%) were had inadequate coping strategies.

Key words: *Care giver, Burden, Coping strategies,*

Background of Study

In 1896, Kraeplin according ‘manic-depressive psychoses’ as a circumscribed illness entity. Ever since, frenzied depressive mental disease, or the present term used nosologically as ‘bipolar’ mood disorder, has been studied within the Indian perspective. The mood disorders are commonly known as affective disorders. Broadly speaking, the emotions can be described as two main types Affect which is a short-lived emotional response to an idea or an event, and Mood, which is a sustained and pervasive emotional response which colors the whole psychic life[1].Caregivers of patients of schizophrenic disorder and bipolar major affective disorder (BAD) expertise appreciable burden whereas caring their patients. They develop totally different cope methods to cope with this burden. Care giving is a chronic stressor and different coping methods are used to handle such a situation. The present study

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attempts to assess coping in caregivers of Chronic Schizophrenia and Bipolar Affective Disorder and make a comparison between them. The study also tries to assess the relationship between the burdens experienced by the caregivers of both these groups of patients with the coping strategies adopted by them. It was a hospital based cross sectional and comparative study, conducted in the Department of Psychiatry, Assam Medical College and Hospital with a sample size of 30 primary caregivers of equal number of patients of Chronic Schizophrenia and 30 Primary caregivers of equal number of Bipolar Affective Disorder patients. Appropriate statistical tests were used for analysis of obtained data setting significance threshold at p coping (90%) followed by external attribution and magical thinking. Among the caregivers of patients of BPAD the most commonly used coping strategies included help seeking (93.33%) followed by religious coping strategies and external attribution. [2] **Materials and Method:** The researcher used quantitative research approach to assess burden and coping strategies. The research design was descriptive research design. The tool reliability coefficient 'r' of the scale was 0.7, hence it was found reliable. Total 120 samples were selected by non Probability convenient sampling technique. Total two scale used namely Zarit burden interview and Rating scale for assessing coping strategies to collect data. The conceptual framework adopted is Sr.Calista Roy's adaptation model(1984) the main concept of this conceptual framework is human being, stimuli, adaptation models and nursing.

ASSUMPTION 1. The caregivers of affective disorders patients may experience some level of burden and The caregivers of affective disorders patients may use some coping strategies.

Results

SECTION I: Deals with analysis of data related to assessment of the level of burden among care givers in terms of frequency, percentage.

Table.No.1: Classification of respondents based on levels of burden among care givers of affective disorders.

N=120

Sr. No	Level of Burden	Score	Frequency	Percentage%
1	No or little burden	0-20	13	10.83%
2	Mild to moderate burden	21-40	18	15%
3	Moderate to severe burden	41-60	60	50%
4	Severe Burden	61-88	29	24.17%

The above table describes the levels of burden among care givers of affective disorders, 60(50%) were had moderate to severe burden, 29(24.17%) were had severe burden, 13(10.83%) were had no or little burden and 18(15%) were had mild to moderate burden.

SECTION II: Deals with analysis of data related to assessment thecoping strategies among care givers of affective disorders patients in terms of frequency and percentage.

Table No.2: Classification of respondents based on coping strategies among care givers of affective disorders.

N=120

Sr. No	Strategies	Score	Frequency	Percentage %
1	Inadequate coping strategies	01-24	08	6.67%
2	Moderately adequate coping strategies	25-50	19	15.83%
3	Adequate coping strategies	51-75	93	77.50%

The above table describes the coping strategies among care givers, 19(15.83%) were had moderately adequate

coping strategies, 93(77.50%) were had adequate coping strategies and 08(6.67%) were had inadequate coping strategies.

Discussion

The study was descriptive in nature and the population taken for the study was of a low socioeconomic status. An Exploratory study to assess the level of burden and coping strategies among caregivers of patients with affective disorder at selected hospitals of sangli miraj kupwad corporation area. The findings of the study have been discussed with reference to objective and assumption.

Discussion regarding demographic variables:

• Majority of the caregivers, 30(25%) were between 31-35 years. The majority of care givers were 70(58.30%) were females. With regard to religion, 80(66.7%) were Hindus. Majority 69(57.5%) were graduates. With regard to monthly income, 50(41.66%) were had Rs. 10000 -15000 income per month. In relation to the type of family, 80(66.70%) were from joint family. With regard to duration of care giving, majority 40(33.33%) were giving for 1 to 3 years, In relation to the care givers relationship, 30(25%) were fathers, 30(25%) were son.

Objective 1.To assesses the levels of Burden among care givers of patients with affective disorders.

The study reveals that the majority caregivers of affective disorders patient 60(50%) were had moderate to severe burden, 29(24.17%) were had severe burden, 13(10.83%) were had no or little burden and 18(15%) were had mild to moderate burden.

Objective 2.To assesses the coping strategies among the caregivers of patients with affective disorders.

The coping strategies among care givers, 19(15.83%) were had moderately adequate coping strategies, 93(77.50%) were had adequate coping strategies and 08(6.67%) had inadequate coping strategies.

Conclusion

This chapter deals with the conclusion, implication, recommendation and data collected from 120 individual samples regarding the level of of burden and coping strategies among care givers of affective disorders. The data was collected by using the Zarit burden Interview and Rating scale for assessing coping strategies. The study was conducted at selected hospitals, Sangli and Miraj,kupwad corporation area. The data analysis was done by descriptive and inferential statistics. The findings of the study are as follows; The study reveals that the care givers of affective disorders patients was 60(50%) were had moderate to severe levels of burden, 29(24.17%) were had severe burden, 13(10.83%) were had no or little burden and 18(15%) were had mild to moderate burden. The mean percentage score was 54.71 with mean and standard deviation of 48.15±2.75. The coping strategies among care givers of affective disorder using 19(15.83%) were had moderately adequate coping strategies, 93(77.50%) were using adequate coping strategies and 08(6.67%) were using inadequate coping strategies.

Conflict of Interest: - Column is Nil

Sources of Funding: - Self

Ethical Consideration: - Permission was obtained from the research ethical committee of the Bharati Vidyapeeth (Deemed to be) University College of Nursing, Sangli and permission taken for data collection from Hospital authority of sangli Miraj, Kupwad Corporation area. Informed consent was obtained from individual(Samples)who are selected for the study. Ethical clearance was done by head of committee members Dr shripriya and Dr. Nilima Bhore.

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Cognitive Impairments and its Associated Risk Factors among Patients with Diabetes Mellitus

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Abstract

Background: Diabetic patients are considered to be more prone to develop cognitive dysfunction and further leading to dementia, hence systematic assessment and identification of risk factors plays a key role. Aim and objectives: To study cognitive impairments and its associated risk factors among patients with diabetes mellitus . Settings and Design: A hospital-based Multicentre cross-sectional study was conducted. Methods and Material: In this study 245 individual medically diagnosed to have diabetes mellitus were recruited according to inclusion and exclusion criteria. Demographic data included age gender and duration of diabetes smoking, BMI, Family history of diabetes and Hypertension *HbA1c* was noted. Cognitive assessment was done using Modified Mini Mental Scale (3MS). Data was collected and subjected to statistical analysis. Results: The result shows about 22% had moderate cognitive impairment and associated risk factors can be medications, age, glycaemic control, Hypertension, family history. There is no correlation of Cognition and duration since diagnosed to be diabetic and BSL whereas weak linear relationships exist between cognition and Age and *HbA1c* and strong linear relationship between cognition and BMI in Patients with diabetes. Conclusions: Diabetic patients do exhibit Mild cognitive dysfunction with various associated risk factors.

Key-words: *Diabetes, smoking, Duration of diabetes, Obesity, Hypertension, Cognitive impairment, HbA1c, Modified mini Mental Scale.*

Introduction

Diabetes mellitus is autoimmune metabolic disorder, caused by insulin deficiency, is complex in nature and has various factors related to it, long-term complications and co-morbidities can affect the cerebral cortex [1]. Islets of langerhans in Pancreas especially the beta (β) cells secrete insulin. Defect in response of insulin causes diabetes mellitus. Type 1 Diabetes Mellitus also called as Insulin-Dependent Diabetes Mellitus (IDDM) or juvenile onset diabetes is caused by destruction of β cells which leads to deficiency of insulin. Type 2 Diabetes Mellitus also called as Non-Insulin Dependent Diabetes Mellitus (NIDDM) or maturity onset diabetes caused due to impaired insulin secretion or insulin resistance [(1,2,3)] Long term diabetes affects central nervous system, peripheral nervous system mainly manifest in the clinical impact of diabetes.[4]

Type 2 diabetes is often associated with increased risk of accelerated cognitive decline and almost two times more susceptible to experience cognitive decline compared to those with normal glucose tolerance. Various researches have suggested that Type 2 diabetes affects cognitive domains like verbal memory, attention and processing speed and executive functions when performing task with change in environment and challenges. Diabetes has also been consistently related with cognitive decrements such as reduced abstract reasoning, complex motor functioning and working memory. [1]

Cognitive dysfunction affects memory, learning and attention. In mild cognitive impairment there is cognitive

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dysfunction without affecting the daily activity of life. Person with mild cognitive impairment can self manage their daily routine. Conditions for cognitive dysfunction are hyperglycemia, hypoglycaemia, insulin resistance and insufficiency of insulin in patients with diabetes. In young population due to immediate hypoglycemia, acute cognitive dysfunction can be observed. (5)

Subjects and Method

Study setup and design: A Multicentered hospital based Cross-sectional study was conducted.

Method: 398 participants had a diagnosis of type 2 diabetes according to the World Health Organization 1999 criteria, and 245 individuals were included in the study. Study was conducted from July 2018 to January 2019. [6] Both males and females were included. Subjects who willing five Informed Consent were included in study. An exclusion criterion was patient with Dementia, Alzheimer's disease and any psychological disorder pregnancy. Demographic data included age gender and duration of diabetes, smoking, Family history of diabetes, obesity and Hypertension, BMI, BSL, HBA_1C was noted. Cognitive assessment was done using Modified Mini Mental Scale (3MS). Data was collected and subjected to statistical analysis.

Results

Demographic data for diabetic patients with mean age 73.22+7.9 , Mean duration since diagnosed to be diabetic was 18+10.82, mean Cognition in diabetics was 75.59+1.6.Also mean BMI was 25.67 +5.351 with Mean BSL and HbA1c as 190+54.13 and 7.118+0.958 respectively. Table 1 shows that Family history was exhibited in 72.72%, Hypertension in 50%, Diabetic Male were 48% and Females were 52% and diabetic had addiction of Smoking in 68%.

Table 2 shows that there is no correlation of Cognition and duration since diagnosed to be diabetic , and BSL whereas weak linear relationships exist between cognition and Age and HbA1c and strong linear relationship between cognition and BMI in Patients with diabetes.

Table 1: Percentage of Family History Of Diabetes Cognitive dysfunction Gender Distribution, Hypertension among Diabetics with Cognitive dysfunction.

Risk Factors	**Percentage**
Family History of Diabetes	72.72%
Hypertension	50%
Gender Male	48%
Female	52%
Smoking	68%

Table 2: Correlation of Age Duration of Diabetes, BMI, BSL, HbA1c and Cognitive Dysfunction in Patients with Diabetes.

Parameters	**Mean+SD**	**Person correlation (r)**
Age	73.22+7.9	0.0175
Duration since diagnosed to be diabetic	18+10.82	-0.03622
BMI	25.67 +5.351	0.1337
BSL	190+54.13	-0.1996
HbA1c	7.118+0.958	0.0846

Discussion

Study showed that 22% had moderate cognitive impairment (MCI). There is no correlation of Cognition and duration since diagnosed to be diabetic whereas weak linear relationships exist between cognition and Age and HbA1c and strong linear relationship between cognition and BMI in Patients with diabetes. Risk factors of smoking family history of diabetes, Hypertension are coexisting with patients with diabetes.

The prevalence in urban Kerala of Mild cognitive impairment in patients with diabetes was 26.06%. This prevalence is reported from different areas of the world varies widely between 3% and 42%. Previous researches from India estimated prevalence between 15% and 33%[7]

A research showed that Deficits in memory is correlated with decrease in gray matter density and reduced glucose metabolism in the regions of orbital and prefrontal cortex, temporal cortex (middle gyrus, parahippocampus, and uncus), and cerebellum. Both Type 1 and type 2 diabetes are associated with impaired cognition; the current statistically analyzed data suggests a stronger association of cognitive decline with T2DM. Early Cognitive impairment is observed in individuals who have impaired blood fasting glucose. [8]

The various studies have shown that prevalence of diabetes is higher in men than women, but there are more women Suffering with diabetes than men in recent years. Similar results have been observed related to the proportion of females was much higher than the males suffering with diabetes in our study. Studies have truly delineated that cognition impairment correlates with the glycaemic control as well as the duration of diabetes.

Mohammed Abdul Hannan Hazari and others concluded in the study that due to long duration specifically exceeding 5 years of onset of diabetes showed prominent decline in cognition in as Diabetes is considered a potential atherogenic factor. Also hypertension along with Diabetes further increases the risk of cognitive decline.[10] In type 2 diabetes mellitus, chronic hyperglycemia can be cause of cognitive decline. [10]

Medha N. Munshi concluded in the study that poor glycaemic control i.e. Hypoglycemia and chronic hyperglycemia can factor that can lead to cognitive dysfunction better management of Diabetes is required to prevent cognitive decline in older adults.[5]

E. van den Berg and others concluded in their study that obesity, hypertension, and dyslipidaemia are features that have risk of cognitive dysfunction in younger old. At the age up to 75, increased cholesterol levels and increased BMI are related with accelerated cognitive decline up. [11]

In the general population, studies on other risk factors for accelerated cognitive decline were hypertension and obesity. Hypertension has been suggested to be an important factor of impaired cognition in diabetes. A similar result is seen in this study that A higher HbA1c level was largely unrelated to cognitive dysfunction. [11]

Omorogieva Ojo and others in their study concluded that neurotransmitter acetylcholine functions for cognition and memory formation. Dysfunction in insulin production and insulin resistance could lead to a decrease in acetylcholine levels which may have impact on cognition and memory. Diabetes is a risk factor for decline in cognitive. Hyperglycaemia and hypoglycaemia may result from poor self management of diabetes which can lead to cognitive decline. [12]

Insulin crosses the blood brain barrier and binds with insulin receptor. Insulin plays an important role in cognitive function and also in food intake. Insulin is present in abundance in cerebral cortex and hippocampus which play important role in memory. Due to insulin resistance there is decrease in insulin receptors and decrease insulin in brain. It result impairment in cognition. For some time, cognitive decline has been reported in patients receiving insulin therapy. A recent study showed that up to half of all cases of Alzheimer's disease are attributable to potentially modifiable risk factors – diabetes, midlife hypertension, midlife obesity, smoking, depression, low education level and physical inactivity. Most of these risk factors also contribute to the incidence or progression of diabetes mellitus.[13]

Conclusion

Study concludes that 22% Diabetic patients had moderate cognitive impairment (MCI) wherein they exhibited no correlation between Cognition and duration since diagnosed to be diabetic. Furthermore there exist a weak linear relationships exist between cognition, Age and HbA1c and strong linear relationship between cognition and BMI in Patients with diabetes. The other modifiable and non modifiable risk factors were smoking,

family history of diabetes, Hypertension which coexist in patients with diabetes contributing towards potential cognitive decline irrespective of the age of the patients.

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A Study on Antibiotic Utilization in Pediatric Hospitalized Patients and Antibiotic Stewardship

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Abstract

Background: There is an increasing trend of use of antibiotics in pediatric ward/intensive care unit has resulted in increasing health care costs and the emergence of resistant bacteria. **Objective:** We evaluated the utilization of antibiotics in a pediatric teaching hospital aiming to identify targets for improvement of prescription. **Methods:** Clinical, laboratory and treatment data of patients hospitalized in patient department (IPD) and a pediatric intensive care unit (PICU) were prospectively collected during a 6-months period. A subsequent review of the collected data by a pediatric infectious disease specialist, taking into consideration existing in-house treatment guidelines, was carried out **.Results:** Most common age group receiving antibiotics are between 1-5 years of age. Ceftriaxone alone and in combination with other antibiotics was most commonly prescribed (71.4%). Average number of antibiotics per patient was 1.2 and 70% of patients were on single antibiotic. **Conclusion:** The most cause of hospitalization in our set up is due to gastrointestinal diseases and the antibiotics used frequently is ceftriaxone. It is high time for continuous education of doctors on judicious antibiotic use and strict implementation of existing guidelines for it. Improvement in the availability of rapid diagnostic methods to discern viral from bacterial infections may help reduce the numbers of empiric therapies in favor of pathogen-targeted therapeutic treatments.

Key Words: *Antimicrobials,Infections, Pediatrics, Stewardship,antibiotic utilization*

Introduction

The goals of antimicrobials chemotherapy may involve the time course events of infection. This may be prophylactic, pre emptive, empiric, definitive or suppressive.[1] The empirical therapy involves in giving antimicrobial agents without confirming infection with evidence of the microorganism from the culture and sensitivity. Standard medical treatment depends upon the accurate diagnosis and optimal use of antibiotics. Antimicrobials agents are potentially toxic and may promote resistance in microorganism, very often, there agents are prescribed irrationally in conditions like common cold, upper respiratory tract infection and surgical prophylaxis.[1] Antibiotics are the most commonly prescribed medicines in children with highest incidences found in preschoolers. It has been documented that the prescribing doctors lack the knowledge about antibiotics which leads to irrational prescribing and adds to the medical expenses.[2,3] However, hospitals are considered to be the centre of antimicrobial resistance owing to the higher use of broad-spectrum agents in both adults and children [2].

According to the results of various antibiotic drug utilization studies, 50% to 85% of children receive antibiotics in developed and developing countries.[4] In European countries and the United States, 23-38% of in-patients are given some kind of systemic antibiotic treatment. Antibiotics take the lead among most commonly used drugs in Turkey and account for

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20% of the drug market.[5] Unfortunately, 20-50% of antibiotic treatment is used irrationally. In India the sale of antibiotics is on the rise with 40-60% increase observed over last five years.[6] The fact that one of the most important causes of acquiring antibiotic resistance is the lack of rational antibiotic use has been reported in many studies and has taken its place in the literature as evidence. Inappropriate use of antibiotics leads to some undesired effects such as an increase in mortality and morbidity, drug toxicity and interactions, extended periods of hospitalization, and an increase in expenditures.[7] This problem has been largely observed in developing countries through inappropriate prescribing habits, over interested desires to treat every infection children are mostly suffering from. The present study was designed to determine the antimicrobial utilization pattern in a tertiary care hospital and to ascertain the resulting treatment consequences in a selected pediatric in patients and also intensive care unit.

Materials and Method

This work was a prospective, observational and cross sectional study conducted in the department of paediatrics in collaboration with department of pharmacology, Kalinga Institute of Medical Sciences (KIMS), Bhubaneswar, a tertiary care hospital of Eastern Odisha, in the duration of March to August 2018. This hospital is a 1750 bedded teaching and super speciality hospital. In this study paediatric patients aged 1month-14 years admitted to IPD & PICU prescribed with antibiotics were included.

All the consecutive cases those were eligible for the study during the study period within 6 months was taken into consideration. Institutional ethical committee approval was obtained from hospital and parents given consent were included in the study.

Properly designed form sheet was used for data collection. It includes socio-demographic and clinical characteristics of pediatric patients as well as patterns of antimicrobial utilization during the study period. The format includes degree of polypharmacy of all drugs and antimicrobials in particular, dosage regimen, route of administration, prevalence of single and combination antimicrobials, and prevalence of disease states to which antimicrobials were prescribed, among others.

The collected data were compiled, tabulated and entered in Microsoft Excel 2014. The statistical analysis of data is done by STATA 15.1(College Station, TX: StataCorp LLC). Descriptive statistics followed by cross tabulation was employed to pro- vide the frequency and percentage distributions of the vari ables included in the study. The result was presented using tables, figures, and pie charts.

Results

Figure 1 shows the use of antimicrobials in pediatric ward and PICU patients. A total of 133 patients were selected in the study period rceived antibiotics during their hospital stay. It shows that ceftriaxone alone and in combination with other antibiotics were most commonly prescribed (71.4%) antibiotics. Piperacillin Tazobactum & Cefpodoxime were prescribed in 9.8% of cases each. Ciprofloxacin (1.5% cases), Co-amoxyclav (3% cases) were used in minimally.

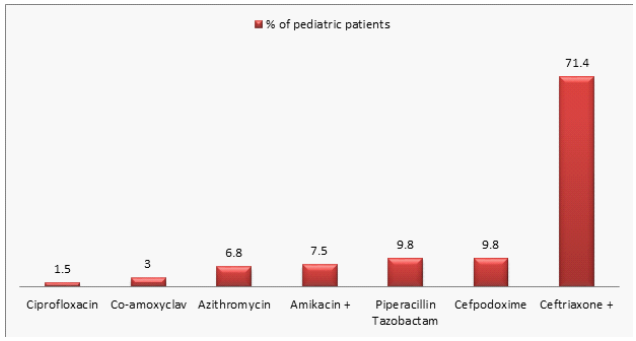

Figure no. 1 : Use of anti-microbials in pediatrics ward and pediatric intensive care unit (n= 133)

(+) denotes in combination with other anti-microbials.

Figure 2 shows the organ system involvement of the pediatric patients. Gastrointestinal system is involved in 27.8% of cases followed by 21% cases where systemic infection prevailed. Less commonly involved systems were respiratory (12.8%) and Cetral Nervous System (11.8%). Skin was least commonly involved in 1.5 % cases.

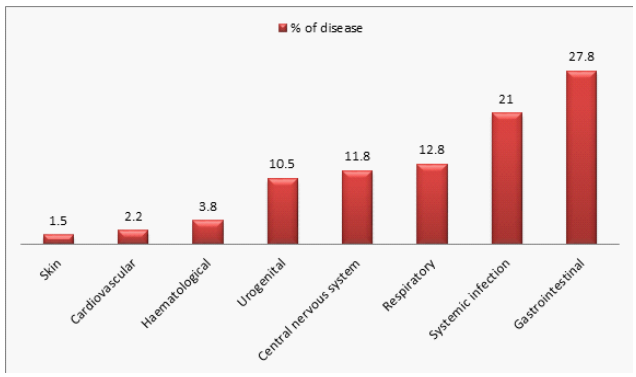

Figure. 2: Morbidity pattern of pediatric inpatients and pediatric intensive care unit (n=133)

As Shown in Figigure 3 maximum number of children belong to 1-5 years age groups (45%) followed by 6-10 years age groups in 23% of cases. Children less than 1 year age group and 11-14 years constitute the lowest (16%) among all cases.

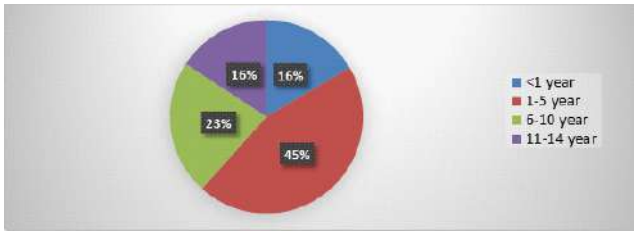

Figure no.3 : Age distribution of patients

Table 1 shows distribution of patient in relation to route of antibiotic administration. Maximum patients (82.7%) were administered intravenous antibiotics whereas only 4.5 % cases administered with oral antibiotics.

Table 1 :Patient distribution regarding route of administration of antibiotic

Route of Antibiotic administration	No. of patient
IV	110 (82.7%)
Oral	06 (4.5%)
Both	17 (12.8%)

Table 2 shows maximum patients (70%) received antbiotic monotherapy, 27% cases received 2 antibiotics and only 3% cases were on 3 or more number of antibiotics.

Table 2: Patient distribution regarding number of antibiotics received

No. of Antibiotic	No. of patient
1	93 (70%)
2	36 (27%)
≥3	04 (3%)

Table 3 shows maximum no of patients i. e. 70.67% were admitted in the hospital for 1-7 days. The duration of hospital stay was 8-15 days in 18.8 % cases. Only 4.5 % of children stayed in the hospital for more than one month.

Table3: Distribution of duration of stay in hospital

Number of days	No. of patient	Percent (%)
1-7	94	70.67
8-15	25	18.79
16-30	8	6.01
≥31	6	4.51

Discussion

Antibiotics are most commonly prescribed and effective drugs which are used to treat microbial infections. The present study was conducted in the department of paediatric IPD (In-Patient Department) & PICU (Paediatric Intensive Care Unit), KIMS, Bhubaneswar between March to August 2018. A total number of 133 patients of 1mo -14 years were included comprising of 120 IPD and 13 PICU patients.. We compared the demographic profile of our patients with that of other studies done in pediatric population in regard to the antibiotic utilization.

The present study shows the percentage of female patients (61.6%) was more than the male patients (38.4%), whereas other previous studies had shown the males majority.[8-11] This may be due to perceived male child bias has grasually changing in the society due to increase female lireracy and education. Also a study by Laya et al had stated that the equal ratio of males and females indicate the current trend equality of both sexes.[12]

As evident from this study , the maximum number of paediatric patients belonged to the age group of 1-5 years followed by the group of <1 year which were 45.11% and 16.54% respectively.This may be due to immature immunity system in the age group of 1-5 years, which made them more prone to infections. Our finding was similar compared to some other studies.[8]

In this study, most frequent clinical indication for which antimicrobials were prescribed was gastro intestinal tract infection i.e. 27.82% followed by systemic infection with fever 21.05% which was similar to the study done by Shivaleela et. Al.[8] Another study had shown that most frequent infection was respiratory tract infections.[12] As our study was conducted during the

months of winter and summer season, GI tract infections were more prevalent.

The study shows the use of antibiotics were accounting 22.32% of prescriptions in IPD and PICU. A study conducted in Nagpur in 2008 which included paediatric outpatient prescription of 500 in a Bombay tertiary care hospital showed antibiotics constituted 79% per prescription.[13] However a study done by Sunil Krande et. al showed the use of antibiotic per prescription to be 39.6%.[14] Its an indication that antibiotic stewardship program in this institute has an impact on antibiotics prescription.

Table 4: Comparision of our study with other studies in regards to number of drugs and antibiotics used

Study	No. of drugs used	No. of antibiotics used
Our study,2018	5.55±2.24	1.24±0.49
Shivaleela et. al, 2014	4.26	2.13
Gizework et. al, 2015	1.70±0.93	1.45±0.59

Table 4 shows the average number of drugs prescribed per patients was 5.5 and average number of antibiotics prescribed per patients was 1.2. But the studies showing result on average number of drugs and antibiotics as per patient was less from our studies.[8,9] The WHO recommends that the average number of drugs per prescription should be less than two.[15] In present study this number is more than two, so it indicates polypharmacy. The average number of drugs per prescription value should be low as possible to prevent the unfavorable outcomes of polypharmacy such as increased risk of drug interactions, increased cost of therapy, non-compliance and emergence of resistance in case of use of antimicrobials. Since these patients were treated in tertiary care hospital & some of them were critically ill, therefore number of drugs used was more. On the other hand our study showed average no of antimicrobial was 1.2. Therfore rational antimicrobial therapy has been followed in the studied institute.

As per the study of Achalu et.al, 22.8 % cases prescribed with single antibiotic, and two antibiotics were prescribed in 51.5% cases.[10] In our study the single antibiotic was prescribed in 70% cases. Multiple antibiotics were prescribed in 28.6% patients according to study of Shivaleela et. al and this was comparable to the study of Choudhury et. al (29%). [8,16]. Out of 30% of cases having more than 2 antibiotics only 3 % cases had three or more antibiotics were used. In present study, most common route of antibiotic administration was found to be I.V route (82.7%) followed by oral route (4.5%). The same study done by Shivaleela et. al and Tadesse et. al.[8,10] This study was conducted on admitted cases, so most common route of administration was I.V route.

According to our study, the mean duration of stay in hospital was 9.5 which was nearby similar to the study of Srivastava et.al (7.3) and Roy et. al (6.3) and also it was compared to Gupta et. al (5.28) and Rasheed et. Al (4.5).[17-20] It may be due to 14 patients who stayed for more than 20 days because of chronic illness like tuberculosis, post encephalitis sequelae and cerebral palsy leading to increase in hospital stay as compared to other studies. But in majority (89%) of children had average duration of hospital stay was around 7 days.

Our study will be of help to develop evidence based medicine with high quality information in the health care facilities. Further, standard treatment guidelines may be developed like in CMC Vellor for antimicrobial uses in adults.[21] Similar guidelines may be developed to treat paediatric patients. This will minimize the off level use of medicines for pediatric use which is very wide spread in India.[22] Research questions relevant to India getting especially on antimicrobial resistant is lacking.Our study will be of help in evidence based guidelines for making for treatment of pediatric patients.

Limitations of the study:

This study was conducted for period of 6 month extending from March to August 2018. As the study was not conducted by full year as a result the seasonal variations in paediatric illness was not documented.

Conclusion

The most cause of hospitalization in our set up is due to gastrointestinal diseases and the antibiotics used frequently is ceftriaxone. Efforts need to be undertaken towards continuous education of doctors on judicious antibiotic use, as well as ensuring compliance with existing guidelines. Improvement in the availability of rapid diagnostic methods to discern viral from bacterial infections may help reduce the numbers of empiric therapies in favor of pathogen-targeted therapeutic treatments.

Conflict of Interest – None

Source of Funding- Self

Ethical Clearance – Yes

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Understanding the Basics of Research as a Beginner: A Highlighter

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Abstract

Research has grown beyond leaps and bounds; scientific progress solely depends on inquisitiveness and tireless coordination of teamwork. The word research is so attractive for a beginner, the student fraternity is overwhelmed about this process. Irrespective of any field, now the research is becoming an indispensable part of the educational system. This article is intended to create basic awareness about research and its components, especially for the research-oriented students in the field of medical, paramedical, allied health sciences, etc.

Key words: *Research, bioethics, clinical trials, good clinical practice*

Introduction

Biomedical research is based on fundamental biological scientific principles, which will focus on personal healthcare and public health. Basic research is also called as bench side research; it deals with in-vitro and in vivo experimental models involving the organisms or animals to obtain a valid outcome to further try on the humans. When the basic research results are tried on clinical patients it is called translational research, which is solely intended to trial the results of basic research from bench side to bedside, clinically by using patients virtually[1].

Research is practiced by humans since the time of evolution on earth. In history, the ancient practice of folklore medicine stands as the best example for the oldest model for clinical research; with the time it has gradually evolved through trial and error method. India is at the forefront of contributing to the field of clinical research; medical science like Ayurveda, Siddha, Unani; their medical literature has mentioned the use of medications for several human ailments for thousands of years. Based on its principles, Ayurveda has mentioned therapeutic interventions, and a number of herbs and mineral formulations applied directly to the human subjects with the sole purpose of alleviating human sufferings[2,3].

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Classification of type of study:

Basic research: the basic medical research deals with understanding the functional, cellular or molecular mechanisms in primates through in vivo or invitro studies.

Preclinical research: preclinical research deals with the study on humans, which further supports the clinical trials on patients.

Clinical research: it is conducted on patients in the hospital or on the selected population; it is supervised by physicians.

What is the research question...?

It is the main inquiry of the issue which needs to be addressed through research. The research question should be clear, targeted and simple.

What is a pilot study...?

It is the study performed on a small scale by using a minimum number of participants/subjects.

This study gives every opportunity to the researcher/ investigator to understand all aspects of the main study including its feasibility, sample size, time duration, troubleshooters, etc.

What are the study parameters...?

Parameters are study exponents in the research; which are later subjected to analysis.

Bioethics

Bioethics deals with the study of ethical dimensions of medicine and biological sciences.

Important principles of bioethics are including Autonomy (respect to self-governing), Beneficence (best interest of the subject), Non-maleficence (causing no harm) and Justice (fair treatment)4

Basic research in non-human primates:

Research on non-human primates is a prerequisite for conducting trials on subsequent levels. Animal experiments mean, the use of animals preferably mammals in the experiments for education and research. The basic experiments use nonhuman primates like rats, mice, rabbits, hamsters, guinea pig, monkey, chimpanzee, dog. It can also be done by using fruit flies, cell lines, fish, etc. There are millions of animals that will be sacrificed worldwide for the sake of research every year. Experiments performed by using both vertebrates and non-vertebrates, but using the vertebrates will be taken into account as they are under more strict ethical vigilance. For research, all these animals should be procured from the authorized breeders who are registered under CPCSEA (committee for control and supervision of experiments on the animal) guidelines or from the recognized higher research centres.

Importance of animal testing in biomedical research

In the field of biomedical research, the use of the animal model experiments stands as "**Hall Mark**" of an interventional research study. The great scientists like Aristotle, Erasistratus Galen, etc. have tried their initial experiments on the animals for scientific purposes[5]. Age back, the use of animals got much attention, particularly to test the surgical procedures or use of drugs or devises before applying them clinically to humans. In spite of heavy criticism by the public and the animal protection activists there is a rise in several basic research experiments on animals; because in history, we have learned about the adverse effects of drugs that were used directly on patients. Causing harm to the animals can't justify the human benefit. But still, animal-based research outcome retains its importance in several aspects including, toxicological studies, where the animal experiment model stands as an inevitable tool in supporting the increasing hierarchy of evidence.

In the present situation to justify the rationality and inevitability of the use of animals in the experiments we need to follow principles of 4R.

Replacement: Use of alternate to animal model Ex: in silico i.e. use of computer modeling, in vitro cell line studies, etc.

Reduction: Method which minimizes the number of animals in experiments

Refinement: It deals with the reduced invasiveness, by adopting improved, non-invasive, non-painful procedures by using the most appropriate methods[6].

Rehabilitation: As a 4th component, the rehabilitation of animals will be done after its justified usage[6].

Toxicity study: it is a branch of science deals with the toxins and poisons and their effect and treatment. As per US food and drug administration (FDA), for the development of a new drug entity, it is essential to conduct toxicity tests in the biological subjects[7].

Trials before regulations

In the olden days, before formulating guidelines for clinical research activities, any individual or group of people would be a part of the research event; it was tried on the helpless community like war prisoners or people who convicted under crime, children, patients, aged people, etc. The direct use of drugs like thalidomide and Elixir Sulfanilamide on humans has resulted in the death of the study participants. Based on such consequences of unethical trials on humans, the present era has formulated a code that is mainly focused on obtaining voluntary consent. **By considering the above discrimination in the clinical research, a judgment formulated with a code known as "Nuremberg code" which has** streamlined the research at all levels with the sole intention to protect the safety and dignity of the participants to achieve more precise and valid outcome[8].

History of Clinical trials

The credit of clinical research goes to a Scottish physician Dr. James Lind, M.D. (1716–1794) has treated the disorder called scurvy in sailors, where patients were presented with the sign of bleeding through their gums. He has noticed that the administration of the orange and lemon has shown drastic improvement in their condition[9].

Regulations of clinical trials:

Good Clinical Practice (GCP): It is an international ethical and scientific standard protocol for conducting biomedical and behavioral research involving human participants; which protects participants' safety, rights and confidentiality at all levels[10].

International Conference on Harmonization (ICH): It is an international council that bringing together the regulatory authorities and pharmaceutical industry to discuss the technical aspects of drug registration. ICH's regulations are intended to achieve greater harmony worldwide to ensure safety, effectiveness, and quality of medicines; which are developed and registered in a hassle-free manner[11].

Institutional Ethics Committee (IEC): It plays a role in appointing members; it will review the protocol and informed consent forms (ICF), and periodic progress of the study[12]

World medical declaration of Helsinki: It is developed by the World Medical Association (WMA) in the year 1964; it is including ethical guidance for physicians and all other participants in the research team involving in clinical trials on human subjects. This rule binds all the research participants to the applicable law under its declaration[13]

Role of the investigator: all trial investigations are conducted by qualified and trained persons who are personally supervising the work.

Sponsor for trials:

The sponsor for a clinical trial may include an individual, an industry, an institution, etc. which takes the responsibility of initiation, management, financing, and auditing. They are also taking the responsibility of subjecting the study participants under sufficient insurance coverage, and compensating the subjects in any untoward incidence or reactions[14].

Role of statistics in research

Since the time of conception of the research protocol, the statistics play an important role to format different components of research like study design, conduct, sample size, data analysis, reporting, etc. they are essential to derive a valid and precise conclusion.

What is the placebo effect...?

Placebo is an inert substance without any therapeutic value; it is used to compare with standard control groups. The psychosomatic profile is an important factor to be considered in assessing the placebo drug response. The placebo effect can be better appreciated in the alleviation of symptoms of the pain rather than any other condition[15].

Clinical trials

Clinical trials are research study on human subjects, which is intended to evaluate the effect of biomedical interventions like vaccines, drugs, treatments, devices, new ways of using known drugs or to study drug interactions, etc. The study may also include the evaluation of behavioral interventions[16].

The ultimate goal of CT is to ascertain the drug safety of the subject, risk and benefit ratio before its final approval for marketing. There are many factors involved in research, out of which some are can be controlled, and some others are beyond one's control. Randomization means being nonselective to any application or intervention. Randomization in clinical trials is considered as the basis for the "Evidence-based Medicine"[17].

Blind experiments

Bias is the main concern of the clinical trials where blinding becomes essential to reduce the bias and increase the validity of the outcome. **Blinding is a process where one or the other participants in the study were deliberately kept unaware of intervention. Blinding is an important factor to ensure objectivity in the clinical trial by avoiding or preventing the conscious and unconscious bias in the study[18].**

Types of blind trials:

Open clinical trials: it is the trial where all the level of study participants in the research group will be knowing the intervention.

Single-blind study: where the subject alone in the research study is unaware of intervention.

Double-blind study: where the subject, as well as the researcher both, are unaware of the intervention

Triple-blind study: where the subject, researcher, and analyser are unaware of intervention.

At the end of the study result analysis, all masked or blinded interventions will be disclosed.

Protection of subjects

The protection of the clinical trial participants at all levels is an important issue. Concerned authorities should take care of all necessary precautions to address personal, social and legal issues during and after completion of trials. Any relevant issues should be addressed, and it should be properly compensated for the loss. It is essential to ensure proper compensation for all the study participants who are involved in the clinical trials.

Importance of Informed Consent (IC)

Clinical trial participants are strictly volunteer in its true sense without coercing them for any benefit.

Informed consent is an important prerequisite before allocating any human subject to the clinical trials. Privacy and confidentially of IC should be maintained in all the circumstances. It is very much essential to know whether the subject is a literate or illiterate, or whether he is fit to give valid consent. The investigator should explain and clarify all the doubts of participants regarding the research protocol before taking consent[19].

Types of clinical trials

Screening trial: screening for the possibility of occurrence of diseases in a healthy population

Prevention trail: it deals with the prevention of disease by using supplements, vaccines, devices, lifestyle modifications, etc.

Diagnostic trail: it deals with the accuracy of the disease

Treatment trail: it deals with the effectiveness of treatment in diseased

Conventionally the CT is having the following phases:

Phase 0: It is an Exploratory Investigational New Drug (IND) Study. It will be conducted first on humans; it is also known as human micro-dosing studies by using the sub-therapeutic dose. It is conducted by using 10-15 numbers of limited volunteer healthy human subjects to understand the pharmacokinetics, pharmacodynamic activity, and safety of a new drug or a molecule.

Phase I or Clinical pharmacology trial: It is also called "First in Man", done in small groups with 20-100 in number in healthy volunteers. It is to assess safety through pharmacovigilance and the details of the pharmacokinetic and pharmacodynamic effects of a drug. Dose escalation trial can give an idea about the appropriate maximum tolerable dose which can be used under subsequent trials.

Phase II or Exploratory Trial; the third phase of the clinical trial can be done in 200-300 number of larger healthy human volunteers. It is done in Phase I A is to assess the clinical efficacy or biological activity, and Phase II B is to assess and match the optimum dose, benefit with minimum side effects

Phase III trial or Confirmatory trial: It is a randomized control multicentric trials in a large number of volunteer patients in a group of 300-3000 or more. Such trials are more expensive, time-consuming and difficult to handle, especially while dealing with chronic disease conditions or disease with a long latency/ incubation period.

Phase IV or Post-marketing surveillance: Called post-marketing surveillance trial. It involves a pharmacovigilance study after receiving permission to market an approved drug. If the drug/treatment is found satisfactory in three phases, then it will be approved under the country's national regulatory authority for its use in the general population. Phase IV trials are invariably always under the research radar. [20,21]

Multicentric clinical trials

It includes a large number of participants from different parts of the world, including a wide range of populations; which will compare the results of different centers.

Accessibility of clinical trial reports

Accessing clinical trial data or information is an important prerequisite to tackle the challenges before considering them under policymaking. Archiving the

clinical trial documents is a must, which helps to analyze the data retrospectively in a systematic manner. Now online updates are available on the registered websites which are developed at the national institute of health under the national library of medicine. CT information is always accessible to any common man, through website clinicaltrials.gov and also through Cochrane Library, it is a collection of databases in medicine and other healthcare specialities22,23. The ultimate goal of accessing the clinical trial results is to introduce newer government policies and regulations to provide improvised health care facilities for the benefit of the population at large.

Conclusion

For a beginner, the present review will highlight the components of basic research, preclinical and clinical research. It has created basic awareness about the ethical factors involved in the research at different levels.

Ethical Clearance: Obtained from Institution ethical committee

Conflict-of-Interest: Nil

Source of Funding: Self funding

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Food Insecurity, Standard of Living and Nutritional Status of People Living with HIV/AIDS (PLHAs) on ART: Rural–Urban Differences

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Abstract

Background: Synergistic effect of malnutrition, food insecurity and poor standard of living pour significant changes and poor outcome in already compromised PLHAs due to increased financial burden as well as emotional breakdown.

Objective: To assess the nutritional status , food insecurity and standard of living (SLI) with rural urban differences and their association if any among the PLHAs who have been stablished with one year of treatment

Methodology: A facility based cross-sectional study on PLHAs was carried out in tertiary care centre of western Maharashtra with a sample size of 246. Data was collected by means of pretested semi structured questionnaire after taking Institutional clearance. Strict confidentiality was maintained throughout the study.

Results: The mean age of the study participants was 43.37 years with majority (50.9% rural, 39% Urban) were secondary class educated. Only 20% of urban and 8.5% of rural had income above 10,000 per month. Maximum (48.2 %) of rural were doing heavy works (construction/agricultural) while majority of urban were unemployed (30.5%) followed by business (21%) work. 36.9% (Rural) and 28.6 % (Urban) had spouse positive for HIV status. Even after one year of treatment, only 36.9% rural and 41% urban PLHAs were having CD4 count above 500. 49.6% (Rural) and 46.7% (Urban) were food insecure while 27.7% (Rural) and 14.3% (Urban) had low standard of living. 36.2% (Rural) and 30.5% (Urban) were undernutrition with 51.8% (Rural) and 54.3% (Urban) having abnormal waist circumference. BMI Category had statistically significant association with SLI and food insecurity in urban participants while it was not statistically associated with rural participants

Conclusions: Inspite of freely delivered ART for one year and majority having good adherence rate, there were actionable changes in nutritional changes among PLHAs of both rural and urban areas. Neglected factors like food insecurity and standard of living needs to given special focus to affectively crub the high incidence of undernutrition among them. Immediate long term measures need to be taken to provide them adequate food and basic amenities of life with secure Job status.

Key Words: *HIV, Nutritional status, food insecurity, standard of living*

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Introduction

HIV/AIDS is modern day epidemic with estimated total of 36.7 million people living with HIV/AIDS (PLHAs) globally[1] and 21.17 lakhs Nationally[2]. With sustained international focus and recent scientific

advancement, measures are been taken to curtail the epidemic. In this view, Global strategy has been adopted to end the AIDS epidemic by 2030 with zero new HIV infections, HIV related deaths and discrimination and making people live longer healthier life[3].

With the latest WHO and NACO policy of starting the Anti-Retroviral treatment (ART) at the diagnosis level, will go a long run in making PLHAs lead a happy comfortable life similar to any lifestyle disorders like diabetes and hypertension. However there are various other factors which would determine how well PLHAs lead their life and maintain their clinical stability. Important among them are socio-economic conditions and nutritional status which form the pillars for ART accessibility, adherence, action and disease stability per se.

Nutritional status depends on various factors such as food insecurity, standard of living, income status, awareness level, diet-drug interaction, loss of weight due to opportunistic infections and disease per se[4].

Synergistic effect of malnutrition, food insecurity and poor standard of living pour significant changes and poor outcome in already compromised household conditions due to increased financial burden as well as emotional breakdown. With this even a minor amount of weight loss would result in significant morbidity and decreased survival rate among PLHAs[5]. It is also hypothesized that rural people maybe incurring higher impact due to these as compared to urban PLHAs due to lack of resources, income generation and facilities hinting the need for a study these differences. Undernutrition is thus one the significant factor for increased morbidity and mortatality among PLHAs inspite of ART and highlight the importance of measures to be taken to improve nutrition including food security and standard of living in addition of free ART availability[6].

In view of above, this study was carried out among the PLHAs who have been stablished with one year of treatment with the objective to assess the nutritional status , food insecurity and standard of living (SLI) with rural urban differences and their association if any

Methodology

A facility based cross-sectional study on people living with HIV/AIDS was carried out in tertiary care centre of western Maharashtra. Considering the prevalence of food insecurity, undernutrition and Standard of living (SLI) as per previous studies[7,8,9], the sample size was calculated as 246. Adult PLHAs who came for collecting the medicines, after completion of one year of treatment and consented to be part of the study were included in the study based on systematic random selection. PLHAs with permanent residence were taken for the study while migratory PLHAs with opportunistic infections, HIV wasting syndrome and those who didn't consent for the study were excluded. Institutional clearance was obtained, Informed consent was taken from all study participants as per format and strict confidentiality was maintained throughout the study

Data Collection

Data was collected by means of pretested semi structured questionnaire which included basic demographic profile along with anthropometric measurements, clinical parameters, food insecurity scale[10] and parameters assessing household status using standard of living scale[11]. Urban/rural status, Standard of living, food insecurity and nutritional status were the main variables in the study. Data was entered in excel sheet and was analyzed using stata version 10 and rural urban differences among various variables was studied.

Standard of living (SLI) index was defined in terms of ownership of household goods (as per the NFHS-2 survey principals[11]) by adding the nine components (Table 1). Out of total score of 9, household with 1-3 marks were labelled as low SLI, 4 to 6 scores as medium SLI and 7 to 9 scores were labelled as high SLI. All households were categorized into food secure and Food insecure by means of WHO Household food insecurity access scale (HFIAS) Measurement Tool[10]. Nutritional status was categorized into underweight, Normal and overweight based on WHO BMI (Body mass Index) classification for Asians

Results

The mean age of the study participants was 43.37 years with majority (50.9% rural, 39% Urban) were secondary class educated. 22.9% of urban and 8.5% of rural were college and above educated. 20% of urban and only 8.5% of rural had income above 10,000 per month. Maximum (48.2 %) of rural were doing heavy works (construction/agricultural) while majority of urban were unemployed (30.5%) followed by business (21%) work. 36.9% (Rural) and 28.6 % (Urban) had spouse positive for HIV status. 51.1% (rural) and 41% (urban) were female

Table 1 : Household Characteristics of study participants

	RURAL		**URBAN**	
Accommodation	**Frequency**	**Percent**	**Frequency**	**Percent**
Own	93	66.0%	66	62.9%
Rent	48	34.0%	39	37.1%
Fuel	Frequency	Percent	Frequency	Percent
Charcoal	5	3.5%	0	0.0%
Gas	134	95.0%	99	94.3%
Kerosene	1	0.7%	6	5.7%
Nil	1	0.7%	0	0.0%
House type	Frequency	Percent	Frequency	Percent
Kuchha	15	10.6%	7	6.7%
Pucca	107	75.9%	77	73.3%
Semi-Pucca	19	13.5%	21	20.0%
Latrine	Frequency	Percent	Frequency	Percent
Open	6	4.3%	3	2.9%
Own	91	64.5%	72	68.6%
Public	44	31.2%	30	28.6%
Light	Frequency	Percent	Frequency	Percent
Electricity	141	100.0%	105	100.0%
Persons per room	Frequency	Percent	Frequency	Percent
<=2 persons	18	12.8%	23	21.9%
3 – 5 persons	79	56.0%	57	54.3%
> 5 persons	44	31.2%	25	23.8%
Property (Land)	Frequency	Percent	Frequency	Percent
No	106	75.2%	72	68.6%
Yes	35	24.8%	33	31.4%
Source of drinking water	Frequency	Percent	Frequency	Percent
Pipe	102	72.3%	94	89.5%
Public	9	6.4%	8	7.6%
Pump	13	9.2%	3	2.9%
Tanker	1	0.7%	0	0.0%
Well	16	11.3%	0	0.0%
Water processing	Frequency	Percent	Frequency	Percent
Aquaguard	0	0.0%	1	1.0%
Boil	8	5.7%	4	3.8%
Filter	26	18.4%	17	16.2%
Nil	107	75.9%	83	79.0%
Total	141	100.0%	105	100.0%

Table 2 : ART and CD4 Characteristics of study participants

	RURAL		URBAN	
Adherence	**Frequency**	**Percent**	**Frequency**	**Percent**
< 90%	3	2.1%	4	3.8%
> 90%	138	97.9%	101	96.2%
Total	141	100.0%	105	100.0%
ART initiation	Frequency	Percent	Frequency	Percent
At the time of detection	126	89.4%	97	92.4%
< 2 years of detection	2	1.4%	1	1.0%
2- 5 years of detection	8	5.7%	3	2.9%
> 5 years of detection	5	3.5%	4	3.8%
Total	141	100.0%	105	100.0%
CD4 Counts	Frequency	Percent	Frequency	Percent
<=500	89	63.1%	62	59.0%
> 500	52	36.9%	43	41.0%
Total	141	100.0%	105	100.0%

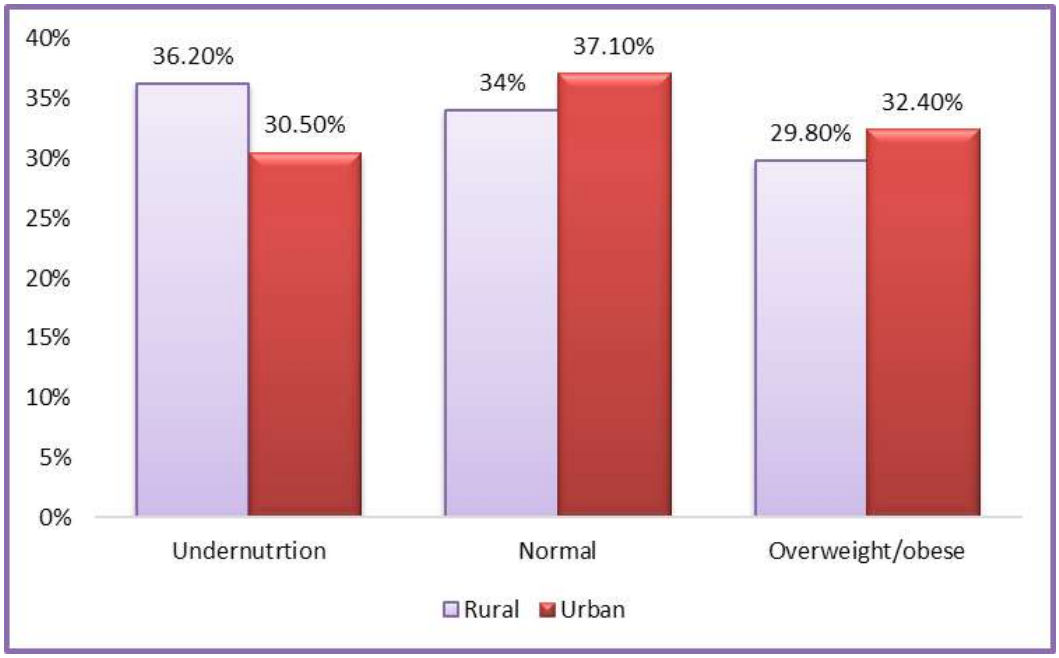

Fig 1 : Nutritional status of PLHAs of study participants

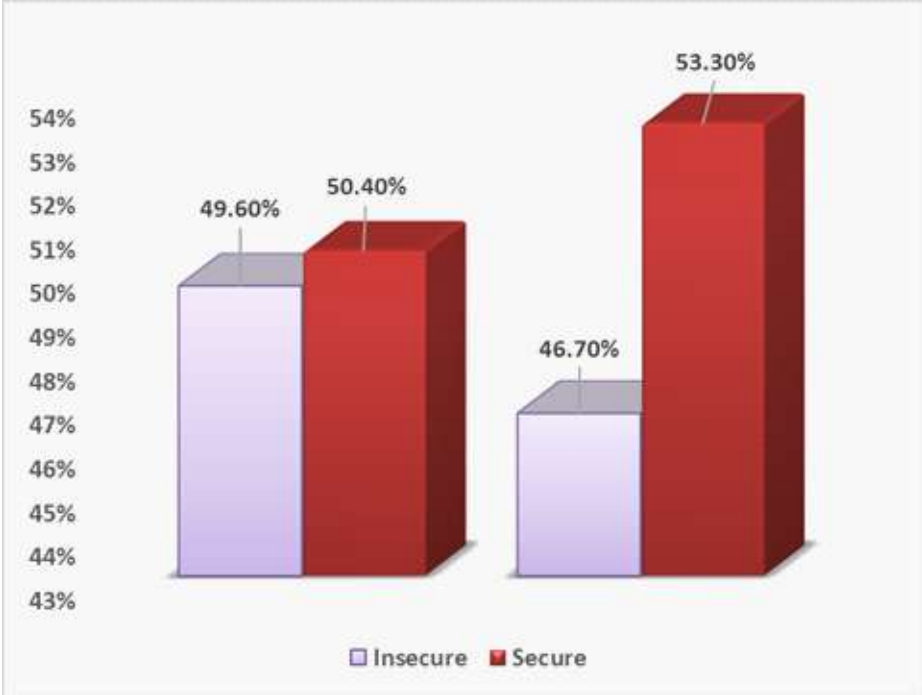

Fig 2: Food insecurity status of study participants

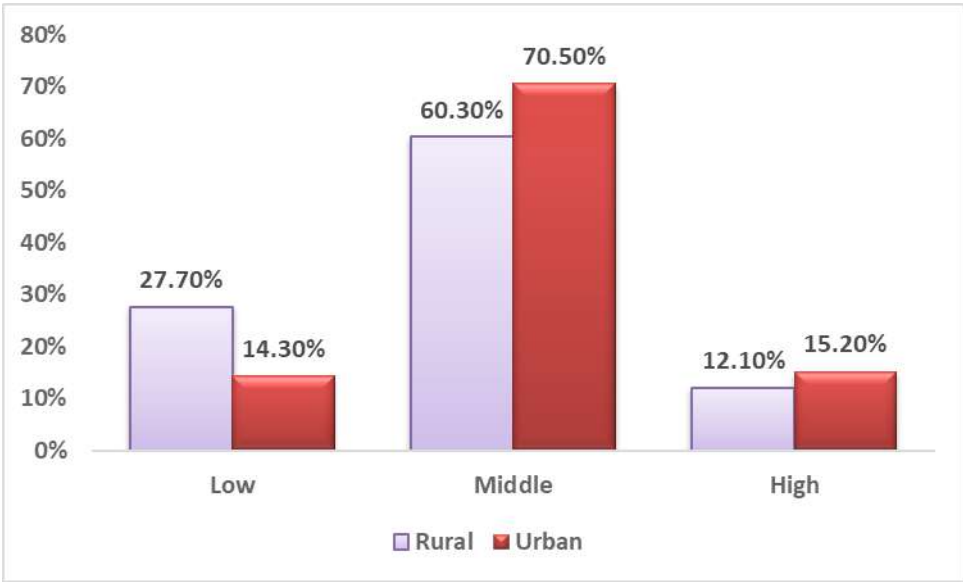

Fig 3: Standard of living status of study participants

Table 3 : Association of Nutritional status and standard of living of study participants

SLI - RURAL						**SLI - URBAN**				
BMI Category	**Low**	**Mid**	**High**	**Total**	**P-value**	**1**	**2**	**3**	**Total**	**P-value**
Undernutrtion Row % Col %	18 35.3 46.2	28 54.9 32.9	5 9.8 29.4	51 100.0 36.2		10 31.3 66.7	20 62.5 27.0	2 6.3 12.5	32 100.0 30.5	
Normal Row % Col %	12 25.0 30.8	28 58.3 32.9	8 16.7 47.1	48 100.0 34.0	0.422	2 5.1 13.3	28 71.8 37.8	9 23.1 56.3	39 100.0 37.1	0.010
Overweight/Obese Row % Col %	9 21.4 23.1	29 69.0 34.1	4 9.5 23.5	42 100.0 29.8		3 8.8 20.0	26 76.5 35.1	5 14.7 31.3	34 100.0 32.4	
TOTAL Row % Col %	39 27.7 100.0	85 60.3 100.0	17 12.1 100.0	141 100.0 100.0		15 14.3 100.0	74 70.5 100.0	16 15.2 100.0	105 100.0 100.0	

Table 4 : Association of Nutritional status and food insecurity of study participants

Food Insecurity - Rural				**Food Insecurity - Urban**				
BMI Category	**Insecure**	**Secure**	**Total**	**P-value**	**Insecure**	**Secure**	**Total**	**P-value**
Undernutrtion Row % Col %	21 41.2 30.0	30 58.8 42.3	51 100.0 36.2		10 31.3 20.4	22 68.8 39.3	32 100.0 30.5	
Normal Row % Col %	30 62.5 42.9	18 37.5 25.4	48 100.0 34.0	0.0836	15 38.5 30.6	24 61.5 42.9	39 100.0 37.1	0.0026
Overweight/Obese Row % Col %	19 45.2 27.1	23 54.8 32.4	42 100.0 29.8		24 70.6 49.0	10 29.4 17.9	34 100.0 32.4	
TOTAL Row % Col %	70 49.6 100.0	71 50.4 100.0	141 100.0 100.0		49 46.7 100.0	56 53.3 100.0	105 100.0 100.0	

ART adherence was above 90% (as per pill count) among 89.9% rural and 96.2% urban. Majority (92.4% urban, 89.4% rural) had started their ART at the time of detection. Even after one year of treatment, only 36.9% rural and 41% urban PLHAs were having CD4 count above 500. 49.6% (Rural) and 46.7% (Urban) were food insecure (Fig 2) while 27.7% (Rural) and 14.3% (Urban) had low standard of living (Fig 3). 36.2% (Rural) and 30.5% (Urban) were undernutrition with 51.8% (Rural) and 54.3% (Urban) having abnormal waist circumference. BMI Category had statistically significant association with SLI and food insecurity in urban participants while it was not statistically associated with rural participants

Discussion

Nutritional status has multidimensional effect on HIV disease progression. It hampers immune system, thereby increase the frequency, severity, duration and complications of infections, the symptoms of which lead to increase weight loss and thereby starts the viscous cycle. In our study, in rural areas, majority (36.2%) were undernutrition while in urban areas majority (37.1 %) had normal BMI followed by 32.4% obese/overweight and 30.5% being undernutrition. The higher number of undernutrition in rural areas may be due to most PLHAs in rural areas had income less than 5000 (77.3%) than urban areas (42.8%) and majority were doing Heavy (construction/agriculture) job getting less pay and more energy expenditure. To co-relate undernutrtion, majority (63.1%) of rural had CD4 count less than 500, even after ART of one year.

In a study carried out in Iran by Hamzeh B et al[12], mean BMI of PLHAs men and women was 22.12 and 25.54 KG/m2. Although the malnutrition was seen in 42.2 % but undernutrtion was seen only in 11.08% and rest were obese/overweight. Majority of undernurtion was seen in men and married PLHAs and main reason was low consumption of diet as compared to standard recommendations. In the contrary, in our study, the undernutrtion was quite high (36.2% Rural and 30.5% Urban) with low CD4 counts (less than 500) inspite majority of them had 90% ART adherence for one year,

While another study carried out by Anand D et al[7] in India showed mean BMI of PLHAs was 19.73 KG/m2 with 40 % undernutrtion among PLHAs which was much higher as compared to our study among both rural and urban PLHAs and major reason was poor consumption of diet (both quantity and quality).

Food insecurity being an important marker for malnutrition even in PLHAs. In our study only 50.4% of rural and 53.3% of urban were food secure. The higher percentage of undernutrition in rural (36.2%) and urban (30.5%) areas inspite of one year of free ART probably hints at higher level of food insecurity (Urban – 49.6%, Urban-46.7%) among them. In our study, BMI had statistically significant association with food insecurity among Urban PLHAs only but not the rural ones

Dasgupta P et al[13] in a study in Darjeeling, India showed that 50.9% of the PLHAs were food insecure. Higher education, higher standard of living and males has statistically significantly associated with high food security while poor morbidity status, more people with HIV positive status in family were associated with high food insecurity. PLHAs used to take loans , burrow money from family, friends and banks to cope up with financial hardship.

Gebremichael DY et al[5] conducted a study in Central Ethiopia showed that 23.6% of PLHAs were malnutrition, 35.2% were food insecure. Important factors which led to malnutrition were no job, clinical morbidity, low CD4 counts and opportunistic infections and importantly the food insecurity similar to our study. Similar findings were also seen in a study carried out by Thapa R et al[14] in Nepal where in one out of five PLHAs were undernourished and important contributing factors being low literacy, low CD4 counts, home care, clinical morbidity and opportunistic infections. The study also assessed the Quality of life domains among the PLHAs and found to be statistically significant association with Body mass Index.

Water sources, water processing technique, sanitary facilities, overcrowding and house type which determine the standard of living have an important influence on the health of household members, especially PLHAs. In our study, only 12.1% rural and 15.2% urban were having high standard of living while majority (Rural – 60.3%, Urban -70.5%) were having middle SLI. As per NHFS 2 survey[11], Standard of living index was low in 24.1 % of Urban and 61.7% rural households with Bihar (57%) being highest in low SLI where as in our study on PLHAs households - 27.7% rural and 14.3% urban had low SLI which had influence on nutritional status. We couldn't find any other studies comparing the standard of living among rural and urban PLHAs

Conclusions

Inspite of freely delivered ART for one year and majority having good adherence rate, there were actionable changes in nutritional changes among PLHAs of both rural and urban areas. With freely available ART, the neglected factors like food insecurity and standard of living needs to given special focus among both Urban and rural areas to affectively crub the high incidence of undernutrition among them. Immediate long term measures need to be taken to provide them adequate food and basic amenities of life with secure Job status.

Conflict of Interest – Nil

Source of Funding- Self

Ethical Clearance – Taken

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Evaluation of Lung Function in Automobile Diesel Mechanics in a Semi Urban Town of South India-Kumbakonam Urban Rural Epidemiological Study–KURES 6

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Abstract

Automobile mechanics are constantly exposed to dust from the exhausts of petrol and diesel. We recruited 50 petrol two wheeler mechanics and subjected them to lung function tests. All were non-smokers without any respiratory symptoms. All mechanics were regular workers with a minimum of three years and at least an exposure of 5 hours of more per day. They were explained about the methodology and asked to attempt three times and the best of three were selected. The incidence of obstructive lung disease (FEV1/FVC< 70%) was only 2%. But the incidence of reduction of effort independent MEF 25- 75 in a significant manner is around 38% which coincided with reduction in PEFR values. [FEV1 = Forced expiratory volume in 1 second. PEFR = peak expiratory flow rate. MEF (25-75) = mean forced expiratory flow between the 25% and 75% of the FVC.] We did not find any correlation with body mass index. We did not resort to analyses of deterioration of lung function with differing exposure years with a low sample size. We suggest that a regular PEFR with practice of established preventive measures may prevent the progress from asymptomatic illness to a symptomatic stage in such health workers.

Keywords: *Spirometry, lung function, automobile, mechanics.*

Introduction

Automobile repair workers of the informal sector are frequently exposed to dusts, chemicals and toxic substances which are harmful to their health. The small auto-body repair workshop is actually an industry in which workers are exposed to hazardous amounts of airborne contaminants. Auto mechanics have risks of inhalational lung injury from both fine and particulate matters, gasoline, petroleum products and many other hydrocarbons[1]. Chattopadyaya [2]has reported an incidence of 25 % obstructive lesions and 21 % restrictive lesions on automobile mechanics. Hence with such a high incidence of abnormalities in lung function tests in the background, we wished to find out the incidence of such defects in our semi urban town of India.

Methods

This observational epidemiological study of lung function among automobile petrol/diesel mechanics was done in a semi urban town of South India in March-2019**.** After approval from the ethics committee (IRBSTH-103/2019), automobile especially two wheeler mechanics working in the small town were enumerated. Among these mechanics, regular workers with a minimum of three years and at least an exposure of 5 hours of more per day were selected. This number was based from an experience from the auto mobile engineer rather any scientific background as there were no earlier clear-cut demarcations regarding this exposure limits in earlier studies. Around sixty seven such persons were spotted out of which seventeen did not give consent for the study. Hence we did pulmonary function tests for all the fifty mechanics who fit into the category of three years and five hours. The study did not include road side mechanics. All the mechanics were studied with --Spirolab-III, a calibrated spirometer with built in computer program; they were explained about the equipment and then the procedure of doing

the test. All the mechanics were given three chances to use and the best test was taken for the study. The study variables were Forced Expiratory Volume in 1 second (FEV1), Forced Vital Capacity (FVC), Peak Expiratory Flow Rate (PEFR), FEF 25-75, age, smoking habit, duration of work, years of experience, and any respiratory symptoms. Considering the literacy of mechanics, the reference values being for non-Indians, we considered a FEV1/FVC % of less than 70 % was significant for obstructive lung disease. Any FVC less than 70% was considered restrictive. We took 70 % as the value to detect any milder form of obstruction in such asymptomatic cases. The incidence of combined diseases was also noted. With such less sample size, we did not resort to sub classifying the same with duration of exposure and lung function. All data were fed into computer and SPSS version 20 was used. Any untoward event was recorded.

Results

Out of the seventy people who fulfilled the inclusion criteria, only, fifty mechanics were willing to undergo the study. The demographic data is tabled in Table 1.

	Mean ± Std.Deviation
Age (years)	37.44 ± 11.4
Weight (kilograms)	65.54 ± 13.69
Height (cm)	155.06 ±11.07
BMI	27.27 ±5.18

All the fifty mechanics were non-smokers without any history of wheezing or allergic bronchitis. The mean years of exposure to dust were 10.46±5.22. The mean hours of exposure per day were 6.38±0.67 hours. The details of lung function among the mechanics are tabled below.

Table 2 showing the pulmonary function test values: (mean±SD)

FVC (litres)	3.48± 0.88
FVC % of predicted	109.3±32.2
FEV1 %	89.22±13.95
FEV1/FVC %	74.83±11.95
PEFR	233.22±89.89
MEF(25-75) litres	2.37±1.03
MEF %	77.06±35.05

FVC = forced vital capacity

FEV1 = Forced expiratory volume in 1 second

PEFR = peak expiratory flow rate.

MEF (25-75) = mean forced expiratory flow between the 25% and 75% of the FVC

From the gross data, it can be easily assumed that there is no gross dysfunction in volumes of mechanics. The values were near normal in majority of mechanics. There was only patient who showed a FEV1/FVC percentage of 66% and hence deemed as obstructive. There was neither a single case of restrictive lesion or combined lesion. The mean PEFR was 233 litres which was less than the expected. Nineteen out of fifty patients had an MEF 25-75 value of less than 70 %. Out of the 19 patients 11 had a value of less than 50%. As such there was no awareness about exposure and lung function in any of the mechanics.

Discussion

Automobile repair mechanics are engaged in a variety of activities which include mechanical work, body repair and reconstruction, re-treading of tyres, spray painting and repair of battery. This work routine exposes them to various occupational health hazards and dangers. In a study of 151 automobile male workers earlier, obstructive impairment was noticed in 25.83% of the workers while restrictive impairment was in 21.19% of the workers. Mixed disease was seen in 10.6% of the workers. The study included smokers and nonsmokers.[2] The incidence in our study was very less compared to them; they have also differentiated the mechanics with age and found out the differences. As such we have not done such comparison. We have found only one case which corresponds to a 2% incidence of obstructive lesion. In a study by Krishnakumar[3] et al, 56.7% of workers had some form of defective pulmonary function. Smoking, increased duration of working hours and years of work showed significant pulmonary impairment. But our incidence is very low. In a few Nigerian studies[4,5], the authors have claimed a reduction of FVC and FEV1 even with five years of exposure. The PEFR was not significantly changed in their study. Dahlquist et al [6]have found out a significant reduction of lung function in mechanics especially exposed to asbestos. As they have found a reduction in major components of pulmonary function tests, they have not looked into the details of MEF 25 even though those values were also decreased. In our case there was a significant reduction of MEF-25-75 up to 38% of cases. The basic difference is that all our

cases were non-smokers and there were no confounding variables as such like any other irritant exposure. Alex et al[7] have also demonstrated a decreased lung function among petroleum product workers. They had a 50 % incidence of lung symptoms. In our study there was no symptom in any of the cases. There were nineteen cases of a significant decrease in the MEF 25-75 values. In these patients we had a significant reduction of PEFR of less than 250 litres. Hence in our study, the PEFR and MEF 25-75 values coincided and a reduction was found in both values. Our study was restricted to asymptomatic two wheeler mechanics and hence the sample size was low. Parker[8] et al had described an incidence of 25 % of obstructive lung diseases in automobile workers. In the same study, they had only FEV1/FVC ratio as a marker of obstruction as a fiftieth percentile. There was no mention about MEF 25-75. Marseglia GL[8] et al have described that MEF 25-75 is early marker of pulmonary dysfunction especially allergic bronchitis. Hence in our case study, we have found out the values of MEF 25-75 were significantly decreased. The limitations of our study were the sample size and absence of age, weight matched controls in the same population. The major new finding which we have found in our study is the reduction of MEF 25- 75 which is an effort independent lung function being affected in our cases. Hence by virtue of age, physical exercise and motivation, the performance of FEV1/FVC may be altered while MEF 25- 75 can't be changed by effort[9]. We had also found that PEFR correlated with MEF 25-75 values. In only one study by Anupama et al[10], they have noted FEF25-75 and found a decrease in 8.57 % which is far less than our results. In our study the average BMI was around 27. There were only three cases of BMI more than 35 all of which showed decrease in PEFR and MEF 25-75 but the FEV1 were normal in these cases. Hence we deduced that the BMI is not affecting the results of our study even though we can't comment with authority as the sample size was low. We planned to take up both petrol and diesel vehicles, but we could muster mechanics with exposure to petrol exhausts only. The exposure to such exhausts alone and decreased lung function has not been studied earlier.

Conclusion

The awareness about allergen exposure and lung function is absent among mechanics. The incidence of obstructive lung disease (FEV1/FVC reduction below 70%) in automobile mechanics is only 2 %. But there was a significant decrease in an effort independent function (i.e MEF25-75) in 38% of cases, which is an early sign of allergen exposure. The PEFR values coincided with reduction of MEF 25-75 values. We suggest that a routine PEFR testing can be done in such workers and protective measures can be taken to prevent the progress to a significant symptomatic deterioration of lung function in automobile mechanics.

Dr MRS Collected the data, Dr SPS conceptualized and Dr MH did the write up

Conflict of Interest – Nil

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Estimation of Thyroid Stimulating Hormone Level in Normal Female School Children in A Semi Urban Indian Town-Kumbakonam Urban Rural Epidemiological Study-KURES-2

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Abstract

Symptoms of thyroid dysfunction are non-specific, yet common and hence screening for abnormalities becomes a necessity. To identify subclinical thyroid dysfunction and offer them the correct medical treatment especially in adolescent female children is an excellent option as a public health prophylactic measure. Hence in this study, we sampled 264 asymptomatic school female children for TSH and found an incidence of 3.4% of high TSH (>5). On the other side, the lower values were found in six (if TSH <0.5) or only two children (if TSH < 0.4). The mean with standard error of TSH values were 2.99 ±0.567. The fasting status was not complied with, and all were random blood samples. All children with abnormal results were counselled with parents and necessary medical advice given. This prevalence is the lowest among similar studies done in any Asian country which is a new finding in our study. Only one child showed a value of 150 who was given drugs and followed up. We theorize that this lesser incidence may be partly due to the study being done in a delta area of a semiurban town.

Key words*: children, female, TSH, hypothyroidism, subclinical,*

Introduction

Subclinical hypothyroidism (SCH) is more a biochemical than a clinical condition which is characterized by serum levels of Thyroid Stimulating Hormone (TSH) above the defined upper limit of reference range, but with normal concentration of thyroid hormones. There are no frank clinical features of hypothyroidism. It's still not clear that these clinically normal children will go in future to develop increased incidence of complications. As such there are very few studies which randomly sample normal children in Indian semi urban population. In a study of young females in south India[1], the incidence of thyroid dysfunction is around 11.7%. There are a few studies which state that the incidence of subclinical hypothyroidism is around 4.15 to 13 % in Asian pregnant population[2,3]. In view of such variations, we proposed to conduct estimation of TSH levels in normal asymptomatic female school children in kumbakonam, a semiurban town of South India.

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Aims

The primary aim was to find out the incidence of subclinical hypothyroidism in female school children in kumbakonam , a semiurban town of India.

The other aims were to counsel the students and parents and the need for drug therapy in affected children

Material and Methods:

This prospective epidemiological observational study was conducted in a semiurban town of India

with a population of 150000 in October 2018. It was done in school going female children between 15 – 17 years of age. The institutional review board (IRBSTH 02/2018) has approved the proposal to conduct the study. The administration of the school has accepted to conduct the study. The procedure of collecting blood from children was explained to parents in vernacular language and consent was obtained from each of them. TSH assay was done in all the collected blood samples as a screening test for thyroid disease. TSH assay was done using electro chemiluminescence immunoassay to the accuracy guidelines given by WHO as standard.

Abnormal TSH values were grouped into two categories:

• TSH elevation: TSH of more than 5 mIU/ml

• Suppressed TSH: TSH <0.4 mIU/ml.

All the subjects with abnormal TSH were instructed to come for follow-up with parents for further testing and advice.

Statistics

With a town population of 150000 and a target population of 3500 of the age group described above, the application of Qualtrix software in sample size estimation for epidemiological studies was done. For a study to have 90 % confidence level and a margin of error 5 %, a sample size of 252 was necessary. Hence a sample size of 264 was made in our study. All data were entered in an excel spread sheet and fed into the statistics software SPSS 20.0 for descriptive statistics and confidence intervals.

Results

All the 264 subjects completed the study. There were no untoward events. All the children were females in the age group of 15-17. The mean with standard error of TSH values were 2.99 ±0.567. The descriptive statistics is tabled below (see Table 1). Only 9 children out of 264 had a TSH value of more than 5. The incidence of abnormally high TSH is 3.4 %. One child had a value of 150, yet she did not have symptoms. Only two out of 264, had a value less than 0.4. but children with values between 0.4 and 0.5 were four in number. Hence If 0.5 had been the cut off for a low TSH , 6 out of 264 had a low TSH values which is around 2.27%.Hence the abnormal TSH values overall is only 5.67%. The parents were called and a counselling session was held along with students giving them proper advice regarding drug intake and further tests.

Table 1 showing descriptive statistics

			Statistic	Std. Error
TSH	Mean		2.998862	.5672822
	95% Confidence Interval for Mean	Lower Bound	1.881869	
		Upper Bound	4.115855	
	5% Trimmed Mean		2.289267	
	Median		2.155000	
	Variance		84.958	
	Std. Deviation		9.2172453	
	Minimum		.0600	
	Maximum		150.0000	
	Range		149.9400	
	Interquartile Range		1.5600	
	Skewness		15.548	.150
	Kurtosis		248.642	.299

Discussion

The prevalence of thyroid disorders especially subtle subclinical dysfunctions depends on a number of factors such as age, sex, geographical factors and iodine intake. The focus should be young females, as a lot of menstrual problems with infertility is on the rise with a possible link with thyroid disorders. Nair et al [4]demonstrated that TSH levels showed a statistically significant decrease postprandial when compared to fasting values. Our samples were taken randomly. Early and effective treatment of any thyroid disorder will ensure a safe pregnancy with minimal maternal and neonatal complications[5]. Hence any screening at the age of 15 – 17 and their correction may be highly useful in reducing infertility and pregnancy associated complications. Hence in this study, we focussed on adolescent female children. Kumaravel et al[1] have shown a prevalence of TSH abnormalities in young females as 12.5 % with a higher TSH in 9.7 %. In a study in Lebanese children[6], the prevalence was found to be 5.4%- 5.7 %. The mean serum TSH 2·57–3·6 mIU/l for boys and 1·83–3·58 mIU/l for girls in an Indian study by Marvaho et al[7], But our study proved the subclinical hypothyroid values to be less than that of the earlier studies to be only 3.4%. But the prevalence of lower TSH values coincides with earlier studies by kumaravel et al. In yet another study in Indian population, the prevalence of high TSH is around 7.7 %. The authors have also correlated the TSH values with abnormal lipid profiles which we have not done[8]. Many of the studies were not clearly mentioning the timing of taking the blood sample whether it's fasting or postprandial. We conducted the study in children where they have taken a very mild breakfast 4 hours ago. We consciously omitted children from the study who have symptoms and are on thyroid drugs. One patient of our study where the TSH was 150 also did not know she was a hypothyroid. She was prescribed drugs with a follow up advice of a complete thyroid profile check-up along with antibody titres. None of the children with subclinical thyroid dysfunction had goitre in our study. We did not enquire whether they are on iodine rich diet or not, as the area of the study is a delta. Nonrandomized continuous sampling may be a limitation in our study. Only two out of 264 children had a TSH value below 0.4 which is also less than the earlier studies. These patients were also advised to have follow up for full thyroid profile testing.

Conclusion

In a sample epidemiological survey of subclinical hypothyroidism in asymptomatic semi urban school female children of India, we found a mean TSH value of 2.99 mIU/l. Lower TSH values (<0.4) were noted only in two children. The prevalence of subclinical hypothyroidism (TSH >5) was 3.4% only which is far less than the previous studies. We probably hypothesize that the decreased incidence may be due to the fact that study being conducted in a delta area of a semiurban town.

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Conflict of Interest – Nil

Dr. MRS designed and conducted the study. DR.TSS helped in data collection. Dr. SPS did the supervision with write up.

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A Review on Medical Tourism in India

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Abstract

Developing country India is the place for medication at an affordable cost than other developed countries in the world. The tourists have been visiting India along with aim of medication needs in various sources of Indian medication services. The Yoga, Ayurveda, Unani, Homeopathy, Siddha, spiritual medication, Mooligai hills station hospitality services and government of India has been providing multi-specialty and higher medical services to the general public at a cheaper cost. The state governments of India and union territory governments are also doing the medication services to the residents of India and also NRIs. Along with the stream of medication service, the private sectors have emerged in a higher end level of medication services as corporate as well as general public utility services with an affordable cost spent by the beneficiaries along with the government health insurance schemes assistances. These infrastructures of India is looking ahead the other countries are mostly utilized the medication services. These are increased now a day, through medical tourism. There is an evident in Indian economy the tourism is one of the indicators to enhance the GDP, among the general tourism, medical tourism is a major apportion of economic resources scattered throughout the country. Particularly in Tamilnadu, Chennai, Coimbatore, Madurai, and Vellore are the major cities attracted other countries people have frequently visited hospitals of government and private corporate hospitals with good results. The present article revealed the previous studies in health tourism in India.

Keywords: *Medication, Tourism, Reviews of Medical Tourism*

Introduction

Tourism is a relaxation of human being visiting various parts/places of the world after attaining certain needs as per their financial strengths. But, in the case of medical tourism is a need of patients and their capacities in the ground of financial supports to take the medical treatment. The tourism is in the behind of various modes of transports. The selection of medical tourism is also impacted on the time, demand, money, availability, political, natural calamities, national securities and other uncontrollable economic conditions. In this juncture, authors have revealed previous studies in the field of medical tourism in India for the past two decades from 1999 to 2018. The authors have collected the previous studies from the available information from the various sources of books, journals, magazines, newspapers, and websites.

Medical Tourism

The concept of medical tourism has interlinked with marketing, finance, insurance, transport, corporate, human resources and other electronics communication and technology. The wellness tourism is the emerging marketing environments booming in an exuberant level due to corporate investors are concentrating medication industries. It results, franchise of corporate hospitals promulgated new ventures on different facilities (transport, residence, physicians, guides and assistances, medical technicians, labs and diagnosis centre and the like) linked with medication industries in certain packages as per the needs of the customers/patients.

Support of Medical Tourism

There are several supporting systems have been done for the betterment of medical tourism such as medical educational institutes conducting seminar, workshop and symposia; government initiations on publicity and promotional activities for the medical tourism. Many of the international brands are promoting the medical tourism (Incredible India, and Wellness or Medical Tourism Service Providers).

Present Scenario of Indian Health Care Sector[1]

With increasing urbanisation and problems related to modern-day living in urban settings, currently, about 50 per cent of spending on in-patient beds is for lifestyle diseases; this has increased the demand for specialised care. In India, lifestyle diseases have replaced traditional health problems. Most lifestyle diseases are caused by high cholesterol, high blood pressure, obesity, poor diet and alcohol Vaatsalya Healthcare is one of the first hospital chains to start focus on Tier 2 and Tier 3 for expansion. To encourage the private sector to establish hospitals in these cities, the government has relaxed the taxes on these hospitals for the first five years. Many healthcare players such as Fortis and Manipal Group are entering management contracts to provide an additional revenue stream to hospitals. Telemedicine is a fast-emerging sector in India; major hospitals (Apollo, AIIMS, Narayana Hrudayalaya) have adopted telemedicine services and entered into a number of PPPs. As of FY16, telemedicine market in India was valued at US$ 15 million and is expected to rise at a CAGR of 20 per cent during FY16-20, reaching to US$ 32 million by 2020.

Telemedicine can bridge the rural-urban divide in terms of medical facilities, extending low-cost consultation and diagnosis facilities to the remotest of areas via high-speed internet and telecommunication. Developments in information technology (IT) and integration with medical electronics, has made it possible to provide high quality medical care at home at affordable prices. It enables the customers to save upto 20-50 per cent of the cost. The home healthcare market stood at US$ 3.2 billion in 2016 and is estimated to reach US$ 4.46 billion by the end of 2018 and US$ 6.21 billion by 2020.

In FY18 (till September 2017), gross direct premium income from health insurance stood at 23.90per cent of overall gross direct premium income for non life insurance segment. Health insurance is gaining momentum in India; witnessing growth at a CAGR of 23.6 per cent during FY15-17. Gross healthcare insurance premium in the month of September 2017 stood at US$ 2.7 billion. Strong mobile technology infrastructure and launch of 4G is expected to drive mobile health initiatives in the country.

Cycle tel Humsafar is a SMS based mobile service designed for women, it enables women to plan their family in a better way. Mobile health industry in India is expected to reach US$ 0.6 billion by 2017. Digital Health Knowledge Resources, Electronic Medical Record, Mobile Healthcare, Electronic Health Record, Hospital Information System, PRACTO, Technology-enabled care, telemedicine and Hospital Management Information Systems are some of the technologies gaining wide acceptance in the sector. AIIMS has converts all its payment transaction as cashless, for which it has associated with mobile wallet company. (MobiKwik, in January 2017) A new trend is emerging as luxury offerings in healthcare sector. More than essential requirements, healthcare providers are making offerings of luxurious services. For example: pick and drop services for patient by private helicopters and luxurious arrangements for visitors to patient in hospital. The Indian medical tourism industry is expected to reach US$ 6 billion by 2018 from US$ 3.0 billion in April 2017, growing at a CAGR of 27 per cent over 2013-16. The number of foreign tourists coming to India for medical purposes rose by almost 50 per cent to 201,333 in 2016 from 134,344 in 2015. Cost of surgery in India is nearly one-tenth of the cost in developed countries. There are 21 Joint Commission International (JCI) - accredited hospitals in India and growing.[2]

Reviews of Literature

Literature evident is the base of conceptual and civilized development. The followings table consisted relevant literatures in the aspects of medical or wellness tourism. The table also segregates as name of the author(s), year of publication, subject area of medical tourism, problems, findings, suggestions, and conclusion.

Table.no.1

Name of the Author	Year	Title	Findings/Problems/Suggestions	Factor
Lydie Ehouman et al	2002	Tamil Nadu: The Path to Becoming India's Leading State	Tamil Nadu has immense natural and cultural resources, giving it great potential to launch into one of India's - and even the regions-top tourist destinations. Furthermore, ICT/ biotech development and direct foreign investment can be tapped into both for ICT solutions to tourism management and marketing challenges, and as a source of financing high-level travelers.	ICT/biotech development and direct foreign investment
The Hindu News	2009	Top Indian hospitals woo medical tourism from Canada	India has launched a big initiative to woo medical tourism from Canada, showcasing the country's high-end and much cheaper healthcare industry to Canadians. Lots of Canadians are already coming to India for medical treatment because of long waiting period here...even for an MRI you have to wait for three to four months. After the IT sector, the Indian medical tourism sector is the next big thing.	High-end and much cheaper healthcare
Tamilnadu Govt. Policy Note	2011	Tourism and Culture Department, Tourism Policy Note 2010-2011	A large number of corporate hospitals and specialized Government hospitals make the State world renowned for cost effective treatment and postoperative facilities. There are three important components that make Tamil Nadu a favoured medical tourism spot. There is no waiting time for the patients. The cost of treatment is less compared to the West. The patients can convalesce at their convenience in the hospitals. Specialised doctors and well equipped Para-medical staff have made this possible by their dedicated efforts.	Time, Cost, convalesce and Physicians Conveniences
Richard Smith et al	2011	Medical tourism: A review of the literature and analysis of a role for bi-lateral trade	Priority needs to be given to data capture, both in individual countries and in the international system. Without data, it will be impossible to assess the impact of opening trade in health services on the importing and exporting countries. Further, countries need to consider aspects of trade from the perspective of greater bi-lateral initiatives, weighing up possible benefits and risks from engaging in trade relationships with different countries individually.	Need of Data
Rose Mary	2014	Medical Tourism in India-Its Strength, Weakness, Opportunities and Threats	The growth of medical tourism in India contributes for the development of infrastructure in medical facilities, medical sciences, national income, employment opportunities and urbanization. Study has argued to minimize or reduce the adverse effects of medical tourism through proper policy framework.	infrastructure in medical facilities and policy framework
Lakhvinder Singh	2014	An evaluation of medical tourism in India	Medical tourism providers should try to maintain service quality and vigorously strive to make India the world leader in medical tourism, a path it is certainly on.	Service Quality

Conclusion

From the above Meta analysis of review of literature authors have found that the Indian medical tourism is expected to meet the challenges, such as Branding, Cost of medication, Fake insurance claims, FDI, Foreign exchange, Hospital standardization and policy framework, Infrastructural development of the Medication Service Provider (MSP), Need of data of Indian MSP, Need of expertise, New structure of medical tourism, Packages, Policy framework of government, Service quality and Supporting health care. Hence, the new research on medical tourism should focus the above area will give a fruitful idea to develop the medical

tourism in India.

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Source of Funding : Self

Conflict of Interest : Nil

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Ophthalmomyiasis Due to Oestrus Ovis Complicated with Methicillin Ressistant Staphylococcus Aureus First Report Near Coastal Area

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Abstract

Ophthalmomyiasis, is the infestation of any anatomic structure of the eye. Larvae of sheep nasal botfly, Oestrus ovis is the most common cause of human ophthalmomyiasis. A 19-year-old male, presented to the ophthalmology outpatient department with a 1 day history of moving foreign body sensation, redness, and excessive watering from his right eye. Multiple larvae were found on bulbar conjunctiva. Larvae were removed and identified as *Oestrus ovis*. Bacterial infection was proved by isolating a heavy growth of methicillin resistant Staphylococcus aureus(MRSA) from conjuctival swabs. Dsual infection of parasitic and bacterial infection of young male adult is proved and also found to be a rare dual manifestation of eye. Hence this case is being reported here.

Key words: *Dual infection, Oestrus ovis, Staphylococcus aureus.*

Introduction

Myiasis is the term applicable to the infestation of human beings and other vertebrates with the larvae (maggots) of Diptera flies. Different parts of the human body may get affect due to myiasis infestation. Most commonly skin and body cavities (mouth, nostrils, ear and eye.). Involvement of any anatomical site of eye is called as Ophthalmomyiasis. [1] Larvae, most commonly, attack the external surface of the eyes or ocular adnexia, e.g. the lids, conjunctiva or lacrimal ducts (external ophthalmomyiasis). In uncommon instances they may penetrate into the eyeball itself (internal ophthalmomyiasis) or may involve the orbit (orbital myiasis).[2] From different parts of the world ophthalmomyiasis have been reported. [3]. Mostly reported were from rural areas and had history of contact with cattle. [4] Oestrus ovis is the most common cause of human ophthalmomyiasis.[5] Dual infection due to Oestrus ovis and Staphylococcal infections have not been reported in Indian literature and is being reported here as a rare case report.

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Case Report

A 19 year-old male, fisherman by occupation, presented to the ophthalmology outpatient department with a 1-day history of moving foreign body sensation, redness, and excessive watering from his right eye, following insect hit into his eye while riding motor bike through sheep raising areas. He gave no past history of ocular or medical problems.

On examination, his visual acuity was 20/20 in both eyes. Eyelids of the affected eye were absolutely normal. The conjunctiva was mildly congested with profuse lacrimation. On slit-lamp examination, multiple, tiny and translucent worms, 1–2 mm in size, crawling over the bulbar conjunctiva were seen. Anterior chamber was found to be normal. Using 4% xylocaine drops as topical anesthesia, 8 worms were removed manually with the help of sterile forceps. While removing worms mechanically with the help of forceps, they were tightly adhering to the bulbar conjunctiva. After removal of all larvae, three swabs were collected for bacteriological

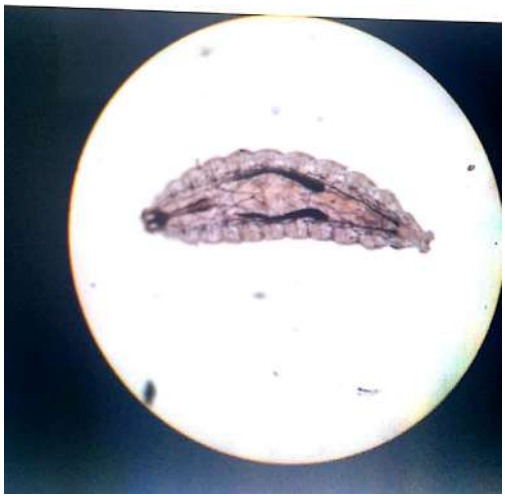
and mycological culture. Two swabs were inoculated on bacteriological media such as blood agar, chocolate agar and Mac Conkey agar. One swab was inoculated on Sabouraud s dextrose agar and processed according to standard microbiological procedures.[6]

Laboratory findings:

On microscopic examination, spindle-shaped skeleton with multiple segments and intersegmental spine bands were seen. The larvae also showed a pair of sharp dark brown oral hooks and tufts of numerous brown hooks on the anterior margin of each body segment and they were identified as *Oestrus ovis.[Figure]*

Staphylococcus aureus was isolated from bacteriological media was found to be methicillin resistant Staphylococci and it was sensitive to, chloramphenicol, Moxifloxacin and cefazolin. No fungus was isolated from Sabouraud dextrose agar even after 14 days.

The patient improved dramatically after a mechanical removal of the larvae and a topical application of antibiotic (Moxifloxacin) –steroid combination therapy. When the patient came for a follow-up after five days, he was completely relieved of his symptoms of foreign body sensation and excessive watering.



Oestrus ovis larvae

Discussion

Hope was the first person to describe myiasis. [7] Worldwide, human myiasis is distributed with various species and larger abundance in poor socioeconomic areas of tropical and semitropical countries. [2] Ocular involvement happens in less than 5 percent of all cases of human myiasis. [8] The most common cause of external ophthalmomyiasis is the larvae of sheep botfly, *Oestrus ovis* Other agents involved in causing myiasis are *Rhinoestrus purpureus* , *Dermatobia. hominis* , *Chrysomya. bezziana* , *Lucilia* spp. , and *Cuterebra*[2]

Morphologically adult bot fly resembles honeybee, which is yellow to gray brown, 10– 12 millimeters long. The gravid fly deposits larvae (Oestrus ovis) in or around the nostrils of cattle (host). These early stage larvae (first instar) deposited, adheres to the mucous membranes within the nasal cavities, then transform to second instars and crawl till the sinuses, where they develop further and mature into third instars, which are shed out for pupation under the soil [9]. The life cycle of this parasite is variable, from couple of weeks to many months, depending on changes in the atmosphere. [10]

Man is accidental host, with the eye being point of adherence for larvae. In man, the larvae cannot be alive beyond the early larval stage and are believed to die within ten days if not taken out [11] Although the threat of orbital penetration and future serious consequences seems to be low, it is prudent to get rid of the larvae from the mucosa of conjunctiva promptly.

External ophthalmomyiasis usually presents with ocular itching, foreign body sensation and a watery-mucopurulent discharge confined to the conjunctiva. [11] Draining of conjunctival sac with saline is ineffective in cleasing out the larvae. Larvae hold the conjunctiva firmly with the help of tiny spines on its outer surface and anterior hooks. Possibilities of misdiagnosis as viral or allergic conjunctivitis is not uncommon. External ophthalmomyiasis typically happens in the summer and autumn which differs from other microbial conjunctivitis, which may occur throughout the year.

A heavy growth of Staphylococcus aureus was isolated from conjunctival swab after 24 hours of incubation at 37 ^{0} C. Based on this preliminary report of Staphylococcus aureus, the patient was started on moxifloxacin and the patient recovered completely. Antibiotic susceptibility testing by Kirby Bauer disk diffusion method also revealed susceptible to moxifloxacin. The patient had bacterial infection following the traumatic episode by the bot fly which could be during the hit by the bot fly or due to the rubbing of the eye by the patient.

Conclusion

A rare case of co infection of external ophthalmomyiasis due to Oestrus ovis and methicillin

resistant Staphylococcus aureus(MRSA). Early diagnosis and prompt initiation of appropriate interventional procedure to remove the Oestrus ovis and anti bacterial treatment saved an eye.

Source of Funding- Self

Conflict of Interest- Nil

Ethical Clearance: Taken from institutional ethical committee.

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A Descriptive Study to Assess the Effect of Habitual Usage of Mobile Phone on the Sleep Quality among Adolescents in Selected Colleges, Chennai

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Abstract

Background: Smartphone has become an indispensable part of our day to day living due to its countless advantages. This habituated the people to become more dependent on mobile phones especially the adolescent age group. They become addicted to mobile technology which in turn declines their cognitive function , academic performance and a poor sleep pattern.

Objective: The purpose/ intention of the study is to assess the sleep disturbances due to the use of mobile phones especially in the night among adolescents.

Materials & Method: A descriptive study conducted on students from selected arts and science colleges in Chennai. The sample size was 100 adolescents selected through simple random sampling technique. Mobile phone use questionnaire, Modified Pittsburgh sleep quality index (PSQI) were used to Assess the Effect of Habitual Usage of Mobile Phone on the Sleep Quality

Results : The results revealed that most of them (38%) received text messages every night, majority of them (43%) sent text messages every night . Majority of them (55%) have experienced sleep latency and sleep disturbances (atleast once a week), most of them (53%) had varied sleep duration. This study analyzed that use of mobile phone every night is significantly associated with quality of sleep at $P < 0.001$ (highly significant)

Conclusion: This study findings shows that habitual usage of mobile phones during night especially after lights are out invariably affects the sleep quality among adolescents

KeyWords: *mobile Phones ,sleep quality,adolescents.*

Introduction

Background: Mobile devices have become widely prevalent over the past decade, the declining cost and increasing computational power of mobile devices, such as smart phones and tablet computers, has created a revolution in personal communications[(1)(10)]. Mobile devices have a remarkable ease of access due to instant-on technology. Adolescents are at an age where good quality sleep, mental and physical wellbeing is of utmost importance. Sadly, to keep up with today's fast paced, technologically oriented society, they engage in habitual mobile phone use which affects their cognitive function and general wellbeing. "It is believed that sleep is a restorative process and a basic biologic need," said Dr. Neil Kline, "When humans are deprived of sleep, there are many body systems that fail. Not only do our performance, memory and attention span suffer, our immune system and endocrine system is also impaired." Deep sleep is essential as it is the time when the body rejuvenates cells and repairs damage suffered during the day. Melatonin, a hormone which regulates the sleep is suppressed due to the exposure of blue light from the

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mobile screen. This causes intruption in the initiation and regulation of sleep cycle.

Habitual use of cell phones late at night after lights are out is particularly popular among younger generations for talking or mailing messages. Moreover, it is a mere entertainment object and serves to keep them in constant contact with their peers. Due to uncontrolled use of mobile devices they become dependent to it termed as Nomo phobia. Difficulty in "shutting off" leads to various sleep disturbances leading to insomnia , tiredness , headache, dizziness, irritability. This lack of sleep can result in attention disorders and poor academic performance in adolescents.

A cross sectional study was done by Munezawa et al., 2011[2] in order to find out the association between the use of mobile phones after lights out and sleep disturbances among Japanese adolescents. The study findings revealed that mobile phone use after lights out has significant association with all forms of sleep disturbance.

The recent studies reported that the habitual mobile phone usage causes marked decline in academic performance[3]. Li et al. (2015) reported that under graduate students (n = 516) participated in the study by competing the validated surveys assessing their cell phone use, locus of control, sleep quality, academic performance, and reduced subjective well-being. This study concluded that use of the cell phone in the class, and at bedtime has a negative effect on sleep quality and academic performance.

Fossum et al., 2014; Li et al., 2015; Exelmans & Van den Bulk, (2016)[4] examined the association between the use of a television, computer, gaming console, tablet, mobile phone, or audio player in bed before going to sleep with insomnia, daytime sleepiness among 532 students aged 18 - 39. The results showed that mobile phone usage for playing/surfing/texting was positively associated with insomnia

Hence, it is important to have an accurate understanding of the impact of mobile phone on health to develop strategies to overcome the adverse effects and enhance the quality of life.

Objective

To assess the Impact of Mobile Phone Usage on the Sleep Quality among adolescents.

Materials and Method

The present study was a descriptive study conducted on students from selected arts and science colleges in Chennai. The sample size was 100 adolescents selected through simple random sampling technique. Data was collected using a demographic questionnaire, mobile phone use questionnaire , Modified Pittsburgh sleep quality index . Ethical commitee clearence was obtained from Institutional Review Board (IRB). The aim and the purpose of this study was explained to the study participants and the confidentiality was assured to them. Data was collected by the above said questionnaire.

Results

Overall, 100 students participated in this study, of which, 62% were females and 38% were males, 48% were aged 18 – 20 years, 52% were aged between 20 – 22 years,95% were single, 5% got married. Out of 100 students, 50% are studying literature, 50% are studying computer science. Majority of the students 83% did not have any other occupation, while 17% are working besides studying.

Table 1: Frequency and Percentage Distribution of Mobile Phone Usage among Adolescents

Type of Use	Every Night	More Than Once in a Week	Once in a week	1 - 3 Times in a Month	Never
Receiving text messages	38 (38 %)	30(30%)	20 (20%)	7 (7%)	5(5%)
Sending text messages	43 (43%)	37 (37%)	8 (8%)	8(8%)	4(4%)
Receiving phone calls	26 (26%)	30 (30%)	25 (25%)	10 (10%)	9(9%)
Calling	18 (18%)	15 (15%)	30 (30%)	20 (20%)	15 (15%)

The above table depicts that, Most of them (38%) receive text messages every night, majority of them (43%) send text messages every night , while 4% of the study participants never send text messages in the night.26% of the study participants receive phone calls every night while 30% receive phone calls in the night more than once a week and 9 % of the study participants never receive phone calls in the night. Approximately 30% of them make phone calls once in a week during night time, while 18% make phone calls every night and 15% never make calls in the night.

Table 2: Frequency and Percentage Distribution of the Sleep Quality among Adolescents

Components of Pittsburgh Sleep Quality Index	Frequency and percentage	Mean and standard deviation
Sleep latency	55 (55%)	M- 2.12,SD - 0.81
Sleep duration	53 (53%)	M-2.17 , SD – 0.80
Sleep disturbance (at least once a week)	55 (55%)	M- 2.29 , SD – 0.73
Habitual sleep efficiency	30 (30%)	M- 2.56 , SD – 0.50
Subjective sleep quality	17 (17%)	M- 2.7, SD – 0.56
Use of sleep medications (at least once a week)	0	0
Daytime dysfunction (at least once a week)	30 (30%)	M- 2.7 ,SD -0.47
		M- 14.14 SD- 3.92

The above table depicts that majority of them (55%) have experienced sleep latency and sleep disturbances (atleast once a week) ,most of them (53%) had varied sleep duration , 30 % of them had day time dysfunction and habitual sleep efficiency is reduced but none were using sleep medications

Table 3: Association Between Mobile phone usage and the sleep quality

Mobile phone usage	Sleep quality	
	Chi square	P value
Every Night	11.45*	0.001* (Significant)
More Than Once a Week	7.65	0.01
Once a Week	6.75	0.01
1 - 3 Times a Month	2.04	0.10

It is inferred from the above table that use of mobile phone every night is significantly associated with disturbances in the quality of sleep at $P < 0.001$ (highly significant).

Discussion

Overall, 100 students participated in this study, of which, 62% were females and 38% were males, 48% were aged 18 – 20 years, 52% were aged between 20 – 22 years,85% were single, 15% got married. Out of 100 students, 50% are studying literature, 50% are studying computer science. Majority of the students 83% did not have any other occupation, while 17% are working besides studying.

Frequency and Percentage Distribution of Mobile Phone Usage among Adolescents

Most of them (38%) receive text messages every night, majority of them (43%) send text messages every night, while 4% of the study participants never send text messages in the night.26% of the study participants receive phone calls every night while 30% receive phone calls in the night more than once a week and 9 % of the study participants never receive phone calls in the night. Approximately 30% of them make phone calls once in a week during night time, while 18% make phone calls every night and 15% never make calls in the night.

Davey S, Davey A. (2014)[5].conducted a mixed method study to assess the smart phone addiction among adolescents and its consequent impact on their health. Systematic review was done using websites of

EMBASE, MEDLINE, PubMed, Global Health, Psyc-INFO, Biomed-Central, and Web of Science, Cochrane Library, and world library - World-Cat, Indian libraries such as National Medical Library of India from 1 January, 1995 to March 31, 2014. Finally, meta-analysis on only Indian studies was done using Med-Calc online software. A total of 45 articles were considered in systematic-review globally; later on 6 studies out of these 45 related to Smartphone's addiction in India were extracted to perform meta-analysis, in which total 1304 participants (range: 165-335) were enrolled. The smart phone addiction magnitude in India ranged from 39% to 44% as per fixed effects calculated ($P < 0.0001$). Smartphone addiction damages the interpersonal skills and can lead to significant negative health risks and harmful psychological effects among Indian adolescents.

The Present study conducted is also among adolescents who are at an urge of smart phone addiction.

Frequency and Percentage Distribution of the Sleep Quality among Adolescents

Majority of them (55%) have experienced sleep latency and sleep disturbances (at least once a week) ,most of them (53%) had varied sleep duration , 30 % of them had day time dysfunction and habitual sleep efficiency is reduced but none were using sleep medications.

The results are consistent with a study conducted by Orzech K, Grandner M, et.al (2016)[6]. Aimed at investigating the association between the self-reported sleep patterns and digital media use in a first-year University student (N = 254, 48% male) population. Students tracked their sleep through daily online diaries and provided digital media use data in 15-min blocks for 2 h prior to bedtime on nine occasions. A longer duration of digital media use was associated with reduced total sleep time and later bedtime, while greater diversity of digital media use was associated with increased total sleep time and earlier bedtime. Analysis of activities in the last hour before bedtime indicated that activity type plays a role in digital media's effect on sleep, with computer work, surfing the Internet, and listening to music showing the strongest relationship to multiple sleep variables. These findings have implications for physical and mental health of University students and can inform design of devices to minimize negative effects of digital media on sleep.

Amra B, AliShahsavari, (2017)[7] associated sleep and late-night cell phone use among 2400 adolescents aged 12-18 yrs in Iran. Age, body mass index, sleep duration, cell phone use after 9 p.m., and physical activity were documented. The Pittsburgh Sleep Quality Index questionnaire was used to assess the quality of sleep. 1270 participants reported to use cell phone after 9 p.m. Overall, 56.1% of girls and 38.9% of boys reported poor quality sleep, respectively. Wake-up time was 8:17 a.m. (2.33), among late-night cell phone users and 8:03 a.m. (2.11) among non-users. Most (52%) late-night cell phone users had poor sleep quality. Sedentary participants had higher sleep latency than their peers. Adjusted binary and multinomial logistic regression models showed that late-night cell users were 1.39 times more likely to have a poor sleep quality than non-users (p-value < 0.001).

Association Between Mobile phone usage and the sleep quality

This study analysed that use of mobile phone every night is significantly associated with disturbances in the quality of sleep at $P < 0.001$ (highly significant).

The above findings are consistent with a cross sectional study conducted by Sahin S, Ozdemir K, (2013)[8] conducted to assess the mobile phone addiction level in university students between 01 November 2012 and 01 February 2013, to examine several associated factors and to evaluate the relation between the addiction level and sleep quality.. The study group included 576 students. The Problematic Mobile Phone Use Scale was used for evaluating the mobile phone addiction level and the Pittsburgh Sleep Quality Index for assessing the sleep quality. The study group consisted of 296 (51.4%) females and 208 (48.6%) males. The mean age was 20.83 ± 1.90 years (min:17, max:28). The addiction level was determined to be higher in the second-year students, those with poor family income, those with type A personality, those whose age for first mobile phone is 13 and below and those whose duration of daily mobile phone use is above 5 hours ($p < 0.05$ for each). The sleep quality worsens with increasing mobile phone addiction level ($p < 0.05$).

Exelmans L, Van **den Bulck** J (2015)[9] assessed the bedtime mobile use and the sleep quality among 844 Flemish adults (18–94 years old). Self-reported sleep quality, daytime fatigue and insomnia were measured using the Pittsburgh Sleep Quality Index

(PSQI), the Fatigue Assessment Scale (FAS) and the Bergen Insomnia Scale (BIS), respectively. Data were analyzed using hierarchical and multinomial regression analyses. Half of the respondents owned a smart phone, and six out of ten took their mobile phone with them to the bedroom. Sending/receiving text messages and/or phone calls after lights out significantly predicted respondents' scores on the PSQI; particularly longer sleep latency, worse sleep efficiency, more sleep disturbance and more daytime dysfunction. Bedtime mobile phone use predicted respondents' later self-reported rise time, higher insomnia score and increased fatigue. Age significantly moderated the relationship between bedtime mobile phone use and fatigue, rise time, and sleep duration. An increase in bedtime mobile phone use was associated with more fatigue and later rise times among younger respondents (≤ 41.5 years old and ≤ 40.8 years old respectively); but it was related to an earlier rise time and shorter sleep duration among older respondents (≥ 60.15 years old and ≥ 66.4 years old respectively).

Conclusion

The habitual usage of mobile phones at late-night has a significant effect with poorer sleep quality among adolescents.Findings reveals that mobile phone use at bedtime is negatively related to sleep outcomes. Longer average screen-time was associated with shorter sleep duration and worse sleep-efficiency. The sleep quality worsens with increasing smart phone addiction level. Young people suffer more than the older adults. Adolescents have to be motivated to have an adequate sleep for a better physical and mental wellbeing.

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Neck Circumference as an Indicator of Obesity and its Comparison with Body Mass Index and Waist Circumference in Coastal Karnataka

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Abstract

Background: Neck circumference can be a simple screening tool for measurement of overweight and obesity. The present study aims to depict neck circumference as a valid measurement of obesity and tries to find out its correlation with BMI and waist circumference among young adults in the age group of 20-30 years.

Methodology: A community based cross-sectional study was conducted in 6 coastal villages of Udupi taluk, Udupi district, Karnataka, among 750 subjects. A pre-tested, semi structured questionnaire was administered to the study subjects after obtaining their consent. The questionnaire comprised of details on socio-demographic variables and anthropometric measurements.

Results: The study showed a strong positive correlation (r) between weight (0.7), waist circumference (0.7) and hip circumference (0.7) with neck circumference among the males, it showed a correlation of (0.6) for all the parameters like weight, waist circumference and hip circumference among the females. ROC analysis showed that the cut off for males at 36.25 cm has a sensitivity of 80% and specificity 77% and the area under the curve is 0.84. Whereas the cutoff for females was found to be 31.75 cm having the sensitivity of 69% and specificity 77% and the area under curve was 0.73.

Conclusion: Neck circumference (NC) measurement is simple and timesaving screening measure that can be used to identify overweight and obesity. Patients with NC >36.25 cm cm for men and >31.75 cm for women require additional evaluation of overweight/obesity.

Key words: *Neck circumference, Waist Circumference, obesity*

Introduction

As we define the term "globesity" synonymous with an escalating global epidemic of overweight and obesity, it is taking over many parts of the world and is seen to be paradoxically coexisting with undernutrition[1]. Serious diet related non-communicable diseases, including diabetes mellitus, cardiovascular disease (CVD), hypertension, and certain forms of cancer have a direct association with obesity[2-5].

An increased risk of morbidity and mortality is seen with both generalized and abdominal obesity[6-7]. Obesity is a predisposing factor for cardio-vascular disease (CVD), which is the main cause of obesity related deaths. Body mass index (BMI), waist circumference, waist–hip ratio or even hip circumference are various important risk of CVD in adults[8,9]. In India, measurement of hip and waist circumference is cumbersome in females due

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to cultural barrier, which is the main problem with most of these anthropometric measurements.

The building blocks of the country's economy as well as country's health are the young adults. The rates for obesity among the 18-30 years old population with some college education have increased significantly in the last decade. In order to have a productive population it is very important to ensure their healthy health status. The present study focuses on a new anthropometric measurement which is neck circumference, as a valid measurement of obesity and aims to find its relation with BMI and waist circumference among young adults.

Methodology

Study settings

The present study was conducted in Udupi taluk in coastal district of Udupi, Karnataka.

Ethical Clearance

Ethical clearance was obtained from the Institutional Ethics Committee of Kasturba Medical College, Manipal University vide letter no: (IEC 216/2012 dated 12/09/2012) and it followed the tenets of the Declaration of Helsinki. An informed written consent was obtained from all the study participants after explaining them the purpose of the study in the local language, Kannada.

Study design

A community based cross-sectional study was conducted in Udupi taluk, Udupi district, Karnataka. We selected 6 coastal villages for the study by simple random sampling. The total population of the young adults (20–30 years) in selected 6 villages was 9546 (males: 4566 and females: 4980).

Sample size

Sample size was estimated using Epi Info™ 7.1.5 software. According to a similar study done by Ben-Noun L et al[10], considering sensitivity of 99% at cut off levels of neck circumference of 37 cm in males and 34 cm in females a sample size of 720 was calculated for the study. Considering a non-response rate of 5% the sample size was estimated to be 750.

Inclusion and exclusion criteria

All young adults aged between 20-30 years and willing to participate in the study were included in the study. People with conditions affecting the neck circumference like goiter, cervical lymphadenopathy and any other neck masses, pregnant women, seriously ill patients and those not consenting for the study were excluded.

Sampling

Stratified sampling with proportional allocation was used to select the required number of study subjects. Locality and gender were considered as the basis for stratification. The centre of a particular locality was visited by the corresponding author, along with a trained female assistant (Auxiliary Nurse Midwife) and the nearest house was taken as the first house for the study in that locality. They then moved in one particular direction and covered all the houses till they achieved the required sample for the locality. At the house, all the members satisfying the inclusion criteria were considered eligible for the study.

Study tool

A pre-tested, semi structured questionnaire was administered to the study subjects after obtaining their consent. The questionnaire comprised of details on socio-demographic variables and anthropometric measurements.

Family structure was categorized as nuclear, joint or three generation (grandparents, parents and children)[11]. Socio-economic status was assessed based on the modified version of Uday Parikh scale for rural areas in India[12]. Occupation was stratified as professional, white collared job, skilled worker, semiskilled worker, unskilled worker, housewife, student and unemployed. Literacy status was classified as literate (if she can read and write with understanding in any language) or illiterate (can neither read nor write or can read but cannot write in any language) and literacy level was the highest level of education completed (Census India 2011)[13].

Weight was measured to the nearest 100 g, in light clothing, using a standard weighing machine after correcting the zero error. Height was measured to the nearest 0.5 cm with the person standing upright against the wall with heels together and touching the wall, and the head held in upright position. BMI was classified according to WHO expert consultation recommendations for Asian population[14].

Waist circumference was measured at the mid-point between the lower margin of the lowest rib and the top of the iliac crest, in mid expiration, in standing position, using a stretch resistant tape. Hip circumference was measured at the inter-trochanteric level in standing position, with the tape parallel to the floor.

Neck Circumference was measured at the mid-point of the neck, between mid-cervical spine and mid anterior neck, to within 1 mm, using non-stretchable plastic tape with the subjects standing upright. In men with a laryngeal prominence (Adam's apple), it was measured just below the prominence. While taking this reading, the subject was asked to look straight ahead, with shoulders down, but not hunched.

Statistical analysis:

Data was analyzed using Statistical Package for the Social Sciences (SPSS) for Windows, Version 16.0. Chicago, SPSS Inc.

Results

We approached 812 subjects to get the required sample of 750 (response rate 92.36%). Out of 812 subjects, 58 subjects denied to consent for the study and 4 subjects were excluded as they were in the category of our exclusion criteria.

The present study had a total of 750 study participants with equal number of males (375) and females (375). Out of 375 males 26.7% males were involved in semi-skilled work followed by 22.7% in skilled work whereas 44.3% females were homemakers. A small percentage (0.8%) were illiterate. Most of the study participants were unmarried (68.7%). Of the total 750 subjects, 462 (61.61%) belonged to nuclear family, 259 (34.53%) belonged to joint family and the rest 29 (3.86%) belonged to three generation family.

Table 1: Anthropometric measurements of young adults (20-30 years) in selected coastal villages of Udupi taluk, Karnataka, India

Measurements	Males (n1 375) Mean ± SD	Correlation (r) of NC with	Females (n2 375) Mean ± SD	Correlation (r) of NC with
Age	25.03 ± 3.37 years	-	25.18 ± 3.36 years	-
Height	169.90 ± 6.34 cm	0.15	156.17 ± 7.05 cm	0.27
Weight	63.42 ± 105.98 kg	0.77	51.10 ± 9.86 kg	0.69
Waist circumference	78.34 ± 8.20 cm	0.79	70.58 ± 9.47 cm	0.68
Hip circumference	92.83 ± 6.88 cm	0.79	86.43 ± 8.11 cm	0.68
Neck circumference	35.79 ± 2.40 cm	-	31.13 ± 2.63 cm	-
BMI ≥ 25kg/m2	21.92 ± 3.20 cm	-	20.96 ± 4.01 cm	-

It was found that 45 (12%) males and 62 (16.5%) females were overweight and 63 (16.8%) males and 45(12%) females were in pre obese and obese category. It also showed that 58 (15.5%) males and 103(27.5%) females were underweight, whereas 209 (55.7%) males and 165 (44%) females had normal BMI.

The table no 2 depicts the mean BMI, Waist circumference and Neck circumference among the various categories of BMI

Table 2: Comparison between mean Body mass index (BMI), Waist Circumference (WC), Neck Circumference (NC) among the various BMI categories (n=750)

	Underweight Mean ± std dev		**Normal Mean ± std dev**		**Overweight Mean ± std dev**		**Obese Mean ± std dev**	
	Males	Females	Males	Females	Males	Females	Males	Females
BMI	17.34 ± 0.53	16.73±1.15	21.12 ± 1.25	20.47±1.26	23.77 ± 0.77	23.82±0.48	27.20 ± 1.67	28.46±3.95
Waist circumference (cm)	69.62 ± 3.66	61.94±5.13	76.20 ± 5.20	70.43±6.70	81.93 ± 3.77	75.10±6.27	90.37 ± 7.06	84.50±8.82
Neck circumference (cm)	33.40 ± 1.20	29.36±1.45	35.18 ± 1.57	31.02±2.52	36.53 ± 1.64	32.23±2.15	39.28 ± 1.94	34.10±2.47

Neck circumference (NC) showed a positive linear correlation with waist circumference (WC) and weight of the study participants as shown in the figure no 1 and 2 respectively.

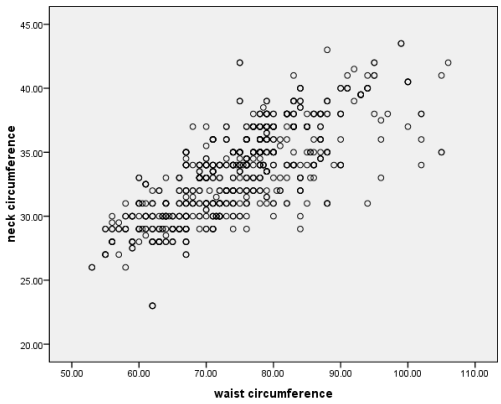

Fig 1: Correlation of WC with NC

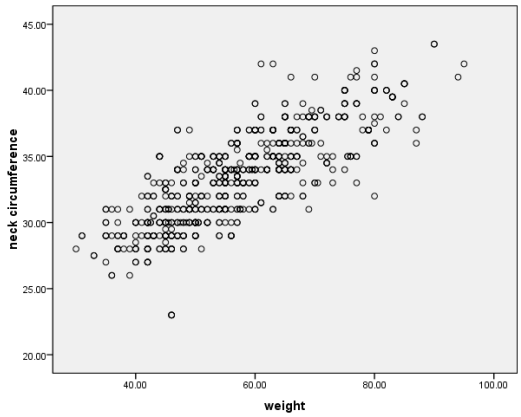

Fig 2: Correlation of weight with NC

Figure no 3 and 4 shows the ROC curve for males and females respectively. The cut off for males at 36.25 cm has a sensitivity of 80% and specificity 77% and the area under the curve is 0.84. Whereas the cutoff for females was found to be 31.75 cm having the sensitivity of 69% and specificity 77% and the area under curve was 0.73.

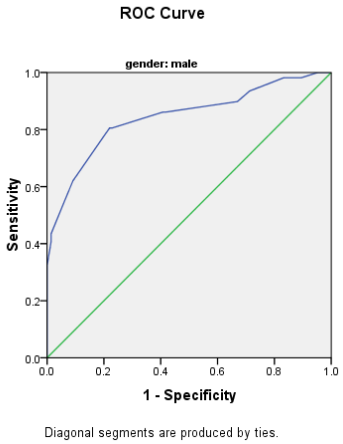

Fig 3: ROC curve comparing overweight/obesity with NC for males

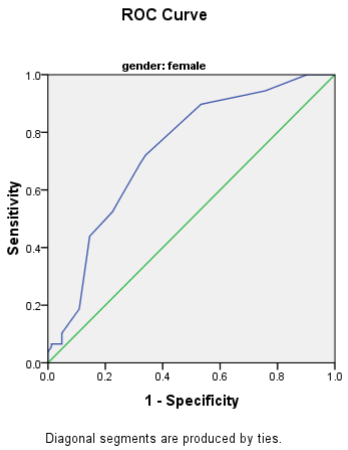

Fig 4: ROC curve comparing overweight/obesity with NC for females

Discussion:

Obesity is the mother of most of the non-communicable diseases and is one of the modifiable risk factors which contribute significantly to diabetes and other non-communicable diseases. India harbors the highest number of diabetic patient in the world next to China and the number is increasing each day[15]. Contrary to the common believe that non-communicable disease are more prevalent among people with central obesity, Patel P et al[16] showed that other risk factors like upper body fat also contributed to the disease number. Considering the above the risk factors, the current study focusses on upper body obesity by measuring neck circumference. The study tries to emphasize that neck circumference can be used as a marker for obesity with a cutoff for Indian population.

Studies have showed that the risk of CVD and other non-communicable disease remains high among the Asian population even at normal range of BMI[14].

The study showed a strong positive correlation (r) between weight (0.7), waist circumference (0.7) and hip circumference (0.7) with neck circumference among the males, it showed a correlation of (0.6) for all the parameters like weight, waist circumference and hip circumference among the females. The above finding is in sync with the study done by Hingorjo MR[17] which claimed similar strong correlation between Neck circumference and Waist circumference. The fact was also advocated by a study done by Onata et al[18] which reported a strong correlation between BMI and Neck circumference. A strong positive correlation between BMI, waist circumference, and NC was also stated by Yang GR et al[19] which was done among 3000 participants in China with a mean age of 64.0±10.1 years. Another study by Ben -Noun et al[10] among 979 subjects (460 and 519 Israeli men and women) showed a strong positive relation between Neck Circumference & BMI for both men and women in his test samples.

There is a strong positive correlation of NC with weight and WC in the study subjects. Several studies have examined the association of conventional anthropometric measures of obesity with NC[20,21]. Neck circumference is a valid marker for identifying obese individuals and correlated well with other anthropometric measurements. Neck circumference has also been shown to correlate positively with insulin resistance and biochemical components of the metabolic syndrome which is a known risk factor of diabetes and other non-communicable disease[10,18,22].

In studies carried out in other countries among healthy population, the standard neck circumference was determined using a BMI index. Also, previous studies in Iran have used cutoff points from studies from other countries or simply used correlation between neck circumference and variables of interest[23-25]. However, in the present study we first calculated proper neck circumference with receiver output curve and in relation with BMI $\geq$ 25 as a valid index of overweight. Using the above mentioned procedure the appropriate cut off for males was 36.25 cm whereas the cutoff for females was found to be 31.75 cm.

Conclusion

One of the simple and time saving measure that

can be used to identify overweight and obese adults is the neck circumference. Using BMI and waist circumference as standards for obesity grading, men with neck circumference of 36.25 cm and above & women with neck circumference of 31.75cm and above are considered to be overweight. So evaluation for NCD risk factors can be done specifically focused on subjects falling under the above mentioned category.

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Potential Role of Electromyography in Kinesiology: A Review

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Abstract

Human beings follow a unique bipedal walking pattern referred to as gait and kinesiology is the scientific study pertaining to movement. Gait analysis has been an evolving area of study and in recent years its application in the development of orthosis, exoskeletons and rehabilitative devices is inevitable. Electromyogram (EMG) being a natural occurring physiological signal providing valuable information on neuro-muscular and musculoskeletal morphologies, its role is indispensable in analysing the underlying cause of movement pathologies. This paper reviews the contributions of EMG in movement analysis so far and its significance to the development of patient specific control of orthotic and rehabilitative applications.

Keywords: *Gait, Kinesiology, Movement Analysis, Electromyography, orthosis, Exoskeleton.*

Introduction

Locomotion is the primary means of survival of animal species and myriads of methods have been devised to enable and refine movement. The specialised bipedal movement referred as Gait is a complex interaction of the musculoskeletal, sensori-motor and neural systems that has optimized and stabilized the gait pattern of human beings [1].

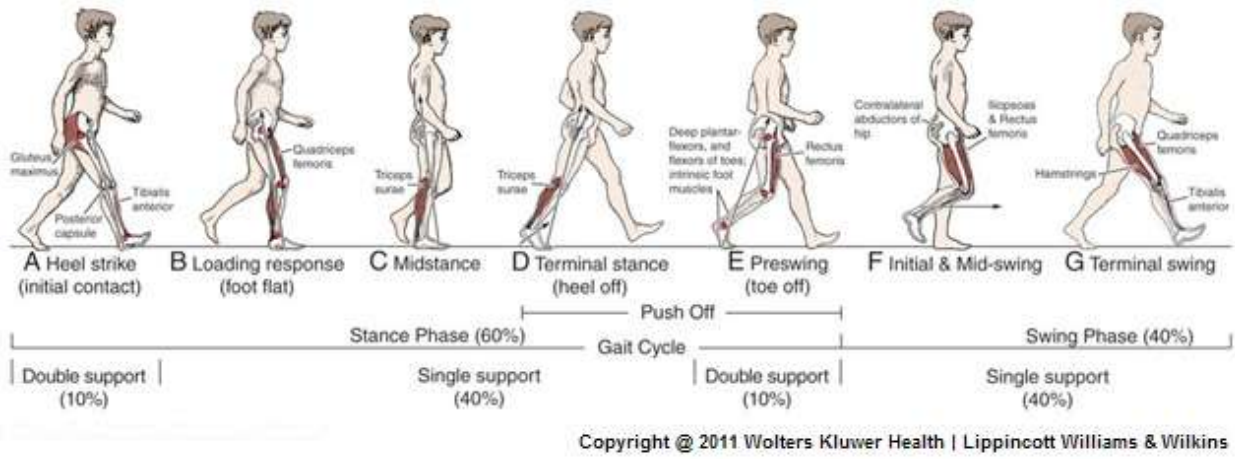

Fig.1. Various Phases of Gait Cycle

Gait is expressed as percentage of gait cycle considering the position of one limb as reference. The various phases of gait are shown in fig.1. It comprises of an initial stance phase during which the reference limb is always in contact with the ground followed by swing phase that corresponds to the period when foot is in the air. Stance phase occupies majority 60% of the

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gait cycle with further subphases namely, initial contact, loading response, midstance, terminal stance, pre swing and swing phase represents the remaining 40% of gait cycle comprising of initial swing, mid swing, terminal swing respectively[2,3]. Analysis of Gait involves two major research components that includes quantification of biomechanical aspects of gait namely, measurement of kinematics (spatio-temporal parameters) and kinetics (forces and torques) of human joints that govern movement followed by analysing the musculoskeletal morphologies that support gait predominantly involving Electromyography(EMG) techniques [5,6,7]

Among the aforementioned technologies, the use of electromyography for comprehensive analysis of gait is at present gaining momentum and has been the current focus of researchers in this area. Being a naturally occurring physiological signal that gives deep insight into muscle activity, EMG explores the biophysical area for understanding human movement. Kinesiological Electromyography applies the potential of EMG in movement analysis and therefore, is an established subfield of modern locomotion biomechanics [8]. As a measure of electrical activity of muscle, its activation patterns & timings can be better quantified to analyse the role of muscles during specific movements thus helping in developing specific solutions to orthopaedic and neuromuscular insufficiency [9,10]. Furthermore, EMG has become an indispensable tool in detecting and analysing various forms of gait pathologies and its underlying neuromuscular etiology[11].

Current paper will focus on the potential role of EMG in gait analysis. The research methods used to analyse the contribution of different muscle and muscle groups during normal/abnormal gait which serves as a valuable tool in gait rehabilitation is reviewed.

Electromyography in Kinesiology

State-of-Art

Electromyography has evolved as a unique method to monitor and evaluate human movement. As a basic actuator that produces necessary mechanical force to cause movement, skeletal muscle and its associated EMG bridges the underlying physiology and biomechanics significantly contributing to the understanding of Human movement[12,13]

Remarkable contributions in analysing EMG patterns during gait were made by specific group of researchers who explored the area of Kinesiological electromyography for two decades [14,15,16,17,18,19,20,21,22,23,24]. The studies were critical in understanding the phasic activity of all major muscles individually, providing useful insights into the neuromuscular system. An initial technology review revealed that the studies on dynamic EMG will parallel and lead to a better understanding of kinematics and kinetics for clinical assessment of injuries specifically in the field of sports biomechanics [25].

The analysis of muscle forces during human movement were the next benchmark contribution in the field of movement science. The famous Hill's muscle model was used to demonstrate a relationship between EMG and muscle forces [26] followed by correlating muscle force information to dynamic joint moments during walking[27,28]. Since last decade more research has been focussed in analysing EMG information along with inertial measurements for movement analysis to precisely analyse the spatio-temporal parameters of gait [29,30,31]. The spatial coordinates of anatomical points of the lower limb define a number of spatial parameters and temporal parameters refer to time marked events with reference to various phases of gait [32,33].

Pathophysiological Gait

Deviations from the normal phasic sequence of bipedal walking is considered as abnormal gait. Many factors contribute to gait abnormalities either as compensation (antalgic) or consequence of a specific impairment (non-antalgic). Antalgic disorders owe to compensatory mechanisms which are characterized by shortening of stance phase, adapted to prevent pain in the affected leg [34,35,36].

Gait disorders are classified into three levels, viz., lowest, where disturbance is usually self-limited or compensated[37], middle, that are mostly multifactorial involving gait modifications due to spasticity, movement disorders etc.[38,39] and highest-level disorders that are mostly due to age related factors like dementia, disequilibrium, cognitive and psychogenic disorders [40,41].

As a bottom-up approach, EMG proves to be the sole opportunity for direct analysis of pathophysiological mechanisms responsible for gait modifications due to non-neuronal factors like alterations in passive muscle-tendon properties [42]. Any compensations during walking as a result of cognitive impairment has opened arenas

to diagnosis and treatment options[43]. Variations in gait between normal control and subjects with poliomyelitis were analysed based on EMG and accelerometers[44,45]

Gait Rehabilitation

Atypical gait patterns that result from joint replacement surgeries and neuromuscular dysfunctions such as stroke often end up in rehabilitation to restore/ assist normal gait [46]. EMG based evaluation and compensation system for pathological gait due to neuromotor disorders are popular research interests at present, since it proves to be the sole opportunity to identify the desired movement, or to assess the subject's motor capability[47]. EMG appear in lower limb muscles approximately 10ms before the muscle actually contracts as an effect of electromechanical delay and when evaluated within this delay a robust coupling between the human and the machine can be achieved thus allowing for the development of EMG driven human-machine interfaces[48]. Electromyography based evaluation on the level of residual activation and neural control strategies were used as the primary control for post-stroke patients undergoing Electromechanical gait training with simultaneous FES[49]. It was seen that motor learning is promoted by the use of residual EMG activity and used to trigger external devices assisting movement[50].

Exoskeletons

An advancement in the field of orthotic development is the Exoskeleton, an active mechanical device essentially anthropomorphic in nature that work in co-ordination with the operator's movements either by augmenting the performance of an able-bodied wearer or assisting the movements of a physically challenged person[51]. To be more precise, exoskeletons are divided into three broad categories namely, Performance-augmenting Exoskeletons (BLEEX, NTU-LEE,HAL-5), Rehabilitation Robots (Locomat, NaTUre-gaits, WalkTrainer, ALEX, LOPES) and Mobile Medical Exoskeletons (eLEGS, MIT Medical Exoskeleton, ReWalker, REX Honda Leg,Hybrid Assist Leg(HAL)) [52]. Among the successful exoskeletons that are developed, HAL uses surface EMG as a sensing modality for control. HAL-based training for improving walking ability or balance and its benefits for patients with chronic stroke, paraplegia and other neuromotor disorders has been successfully reported[53,54].

Conclusion

Kinesiological Electromyography has evolved in the past decade to be one of the major biomechanical measurement methods without a serious competitive method within its class. EMG provides a true understanding and objective evaluation of the neuromuscular activation during movement, paving way for considerable analysis. After a serious review performed based on the available literature it is concluded that

- Electromyography can explore the link between physiological and biomechanical aspects of movement leading to better diagnosis of movement impairment.
- The relationship between muscle co-activations and the distribution of forces among recruited muscles need considerable understanding to discover the synergistic control processes involved in regulating muscular activity during gait. This can greatly help in developing EMG based control for assistive devices.
- Rehabilitation and strength training of muscles also need good understanding of motor control and its underlying rules of neuromuscular system that coordinates/creates movement.
- EMG is one of the major Kinetic variable that are of interest to uncover clues to neuromuscular strategies in learning movements and can be used to document the temporal location and size of muscular demands.
- EMG to muscle force relationships have long been an area of research focus. It has great potential for studying altered muscle function due to varying gait patterns that cannot be readily examined by optimization techniques.

With so many thrust areas of research, Kinesiological Electromyography need more focus in the field of movement science upon overcoming certain limitations. Practical drawbacks related to unpredictable nature of EMG signals and the occurrence of crosstalk remain to be a challenge in analysis. A reliable sensing technology that overcomes the effect of crosstalk can surpass the challenges related to acquisition. Research findings need to be extended in building commercial EMG based systems that can be used for diagnosis, treatment and incorporation into assistive technologies as a mode of sensing and control.

Hence research that focusses more in the analysis of musculoskeletal models scaled and customized to individuals whose EMG and gait data can be used to simulate the actual action of muscles in normal/ abnormal movements and the associated joint forces is needed. Once optimal models are validated, the concept can be extended to real time estimation of muscle forces. Overall, Electromyography for kinesiological studies really seem promising in answering many questions related to movement disorders. As an effective tool for sensing and control, EMG has great potentials to be utilised in the field of rehabilitation and assistive technology.

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Oral Health Literacy and its Relationship with Level of Education and Self-Efficacy among Patients Attending a Dental Rural Outreach Clinic in India

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Abstract

Objective:To evaluate the relationship between Oral health literacy (OHL) with the level of education and self-efficacy among adults (age 18-77 years) patients attending a dental outreach clinic in Udupi Taluk. ***Basic research design:*** A cross-sectional study of adult patients attending a dental outreach clinic by convenience sampling. ***Method:*** Information was obtained about patient's sociodemographic factors along with the self-efficacy by using Dental Copings Belief's scale (DCBS) questionnaire and OHL was assessed by using a word recognition instrument Rapid Estimate of Adult Literacy in Dentistry (REALD-30).One way ANOVA and Pearson's χ^2 test were used for analysis. ***Participants:*** 200adult patients age range of 18- 77 years who wanted to seek dental care in a dental outreach clinic. ***Main outcome measures:*** Oral health literacy (OHL) and Self efficacy (DCBS) ***Results:*** In this study the OHL was significantly associated with the level of education of patients.Among the 200 subjects who claimed to be able to read and write English language andhad completed education till class 10^{th}; more than 50% of the subjects had Low (≤21)OHL scores.Only 12.5% of the total study population had High OHL (≥26) and were clearly able to understand simple dental terminology. Moderate levels of literacy was recorded in 75.6% in graduate and postgraduates indicating that even these people partially understood dental terms. There was no significant association between oral health literacy and self-efficacy.***Conclusion:***Our study suggests level of education to be a strong indicator of the OHL in the Indian Population. Further research to develop new instruments to measure the OHL, in a culturally diverse country like India, which has people of different mother tongues should be encouraged.

Keywords: *Oral health; health literacy; self- efficacy; community outreach.*

Introduction

The concept of Oral health literacy (OHL) has developed over several years and the existing literature is ever increasing in this field. Health literacy refers to the ability of individuals to obtain, understand and act upon health information and to make appropriate health decisions.[1-3] Oral health literacy (OHL) refers to the degree to which individuals have the capacity to obtain, process and understand basic oral health information and services needed to make appropriate health decisions.[4] This concept has not yet gained sufficient weightage in regular dental practice.

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Oral Health literacy is like a bridge between the dental care provider's instructions and the comprehension, thereby abiding of the patient to the same. This role of OHL makes it important for the dentist to ascertain the level of OHL of the patient before any procedure and then treat the patient according to the level of understanding of the patient. After identification of the level of OHL attention should be paid by the dentist to communicate with the public and remove literacy-related barriers to information, decision making, and healthful action. [5] A significant number of patients may have a low level of oral health literacy, which possibly interferes with their ability to process and understand oral health information. Providers should identify patients who are having difficulty understanding and using dental health information and address their needs. [6]

According to Paasche-Orlow and Wolf conceptual model of causal pathways between health literacy and health outcomes the effect of literacy on health outcomes is mediated by patient-level and extrinsic factors grouped as [1] access to and utilization of health care, [2] provider–patient interaction, and self-care.[7] Many factors are related to OHL but amongst the recent ones focus has been given to those that affect behavior because behavior is amenable to change. A successful dental practice is not only related to dental treatment provided, but also to the patient's attitude and behavior towards the treatment. [8] Individual health practices such as oral self-care are based on personal choices.[9] According to the model proposed by Lee et al., Personal characteristics such as self-efficacy mediate and/or modify the impact of literacy on oral health behaviors.[10]

Self-efficacy-Perceived self-efficacy is concerned with people's beliefs in their capabilities to produce given attainments.[11] Perceived self-efficacy is a judgment of capability to execute given types of performances and outcome expectations are judgments about the outcomes that are likely to flow from such performances. Perceived efficacy has a pivotal role because it affects behavior and its impact on other determinants such as goals and aspirations; outcome and expectations. Self-efficacy appraisals reflect the level of difficulty individuals believe they can surmount. [11]

The aim of the present study was to evaluate the relationship between Oral health literacy (OHL) by using Rapid Estimate of Adult Literacy in Dentistry (READ-30)with the level of education and self-efficacy by using a questionnaire on Dental Coping Beliefs Scale (DCBS) among adult (age 18-77 years) patients attending a dental outreach clinic in Udupi Taluk.

Objectives-

1) To evaluate the Oral health literacy in adults visiting a dental outreach clinic in India by using word recognition instrument- Rapid Estimate of Adult Literacy in Dentistry (REALD-30).

2) To evaluate the Self-efficacy using Dental Coping Beliefs Scale (DCBS) questionnaire in the same subjects.

3) To evaluate the relationship between OHL with level of education.

4) To evaluate the relationship between OHL and self-efficacy.

Method-

Sample and data collection- A convenience sample of participants (N=200) was recruited from patients presenting for an initial consultation to a dental rural clinic in Udupi. Written informed consent was obtained for all study participants. Study Design-A Cross-sectional questionnaire study. Inclusion Criteria were-subjects who claimed to be able to read English words, subjects more than 18 years of age but younger than 80 years, subjects who had completed education till a minimum of 10th class, subjects without cognitive impairment, subjects without vision or hearing problems and subjects without obvious signs of drug/alcohol intoxication. Exclusion Criteria: were subjects who are not able to read English words, subjects less than 18 years of age and more than 80 years, subjects who have completed education less than 10th class, subjects not willing to participate in the study, subjects with psychiatric disorders and subjects with other severe systemic illness. Ethical clearance was obtained from the Kasturba Hospital Ethics Committee, Manipal before commencement of the study(IEC 277/2014). Informed consent was obtained from all patients prior to the start of the study. The Oral Health Literacy Assessment was done using REALD-30 which is a word recognition instrument which has 30 dental related words arranged in order of increasing difficulty. [12] The words were read aloud by the subject to the interviewer. The participants were asked not to phonetically deduce the words, but rather to skip a word if they did not know it. One point is given to each word pronounced correctly (zero point if incorrectly). The READ-30 score was categorized as

Low (≤21), Moderate (22 to 25) or High (≥26).[13]

In addition to the above, each patient completed a questionnaire regarding Self-efficacy. This questionnaire was a part of Dental Coping Beliefs scale (DCBS). [14] The participants were asked to mark only one response to each question. Total Self- efficacy was calculated by adding each of the responses. It had 9 questions and the responses were recorded on a Likert scale.The responses were-(1) Strongly agree, (2) Agree, (3) Neither, (4) Disagree and (5) Strongly disagree. Additionally, socio-demographic data was included in the questionnaire -Age, gender, education, occupation, monthly income.

Data Analysis-Statistical analysis was performed using SPSS (version 16.0).One way ANOVA was used to assess the relation between REALD-30(categorized-low, moderate, high)and self-efficacy (continuous variable). Pearson's $\chi 2$ test was used to assess association between education and REALD-30. The level of significance was set at 0.05.

Results

The study population consisted of 200 English speaking adults who visited the dental outpatient clinic. Questionnaire was administered to 200 adults and the response rate was 100.0%.The mean age of the respondents 38.33 years who were in the age range of 18 to 77 years. Among the respondents 41% were males and 59% were females. An individual's completion of the entire questionnaire was ensured by checking for it during the oral health examination. The respondents were asked to complete the incomplete forms. The demographic characteristics of the participants are presented in Table 1. The distribution of REALD-30 is presented in Table 2 of which 12.5% people have high OHL, 30.5% have moderate OHL and 57.0% have low OHL. Self-efficacy in results have been presented in Table 3. The self-efficacy range is 9-29 with a median of 18.0.The co-relation between REALD and Self efficacy was analyzed by One way ANOVA and presented in Table 4.There was no significant association between OHL and self-efficacy.Pearson's χ^2 test was used to test for association between Education and REALD has been presented in Table 5. The OHL was significantly associated with the level of education of patients. 6.0% of the participants completed high school education, 33.0%Intermediate/PUC, 58.5% Graduate/Post graduate and 2.5% Profession/ Honors.

Table 1-Distribution of study participants according to socio-demographic characteristics

Variables		**Participants (%) N=200**
Gender	Male	82 (41%)
	Female	118(59%)
Age (years)	Mean	38.33
	Range	18-77
Socioeconomic status	Middle	159(79.5%)
	Low	41(20.5%)

Table 2- Distribution of REALD-30

	Frequency	**Percentage**
High	25	12.5%
Moderate	61	30.5%
Low	114	57.0%
Total	200	100.0%

Table 3- Distribution of Self efficacy

	Median	Range	Standard Deviation
Total Self efficacy	18.00	9-29	3.73

Table 4- One way ANOVA- Co-relation between

READLD and Self efficacy

		N	Mean Self-efficacy	Standard deviation	Sig.
READLD	High	25	18.520	4.204	0.983
	Moderate	61	18.442	3.909	
	Low	114	18.377	3.548	
Total		200	18.415	3.727	

Table 5- Association between Education and READLD

High Moderate			READLD			Total	Signi-ficance
			Low				
Education	High school	Count	0	0	12	12	0.001*
		%	0%	0%	10.5%	6.0%	
	Intermediate/ PUC	Count	6	14	46	66	
		%	24.0%	23.0%	40.4%	33.0%	
	Graduate/ Post graduate	Count	17	46	54	117	
		%	68.0%	75.4%	47.4%	58.5%	
	Profession/ Honors	Count	2	1	2	5	
		%	8.0%	1.6%	1.8%	2.5%	
Total %		Count	25	61	114	200	
			100%	100%	100%	100%	

Pearson's X^2 is taken as 0.001* as significant

Discussion

The aim of this study was to evaluate the oral health literacy (OHL) and its relationship with self-efficacy among adult patients attending a dental outreach clinic. To the best of our knowledge this is the second study done in India to assess the OHL using READL-30 as the assessment tool and the first study done to look closely into the association between OHL and self-efficacy in an adult Indian population in an outreach dental clinic. In this study the OHL was significantly associated with the level of education of patients which is similar to the findings of another study on Health Literacy. [15]

The dental copings beliefs scale was used to assess self-efficacy. DCBS helps the oral health professional in understanding a patients' belief either in internal or external controls and also the ability to which patient perceives himself/herself to be able to perform given tasks. [14] In the present study, there was no significant association between oral health literacy and self-efficacy. The self-efficacy has been assessed using a self-reported questionnaire, thus this finding could be attributed to the social desirability bias.

Among the 200 study English speaking subjects who had completed education at least till 10th class, who participated in the study OHL scores were very low in more than 50% of the subjects (57%-low OHL). These subjects scored less than 21 which mean these patients are likely to struggle to understand simple dental terminology which is used by the dentists while communicating to the

patients. Only 12.5% of the total study population had High OHL (≥26).This means only a little more than 10% of the whole of the study population is actually clearly able to understand the dental terms used by the dentists. Only moderate levels of literacy was recorded in 75.6% in graduate and postgraduates indicating that even these people understand only some of the dental terms and not all. The findings in the present study indicate that even in an Indian population with a basic level of education who are able to read and write in English have low levels of Oral health literacy. Similar findings are reported by M D'Cruz et al.,2014. [16]

Demands for reading, writing, and numeracy skills are intensified due to health-care systems' complexities, advancements in scientific discoveries, and new technologies. In this study there was no significant association between Oral health literacy and caries status and periodontal status. This could be attributed to the fact that the oral health literacy was taken by a word recognition instrument the REALD-30 which has several limitations.

This instrument is only a word recognition instrument and does not take into account whether the individual comprehends the dental words. Also, pronunciation of words vary in the Indian population due to a difference in dialect. It is possible that incorrect pronunciation may not necessarily mean that meaning of the word is also not known, more so among individuals with lower levels of education.[17] Therefore, the evaluation of oral health literacy via a word recognition instrument like REALD may be misleading. Due to these reasons, an association of oral health literacy with DMFT or CPI is difficult to assess.

Newer tools for assessing oral health literacy should be developed which test comprehension along with simple word recognition. Then the level of health literacy can be measured accurately and associated with oral health outcomes like caries status and periodontal status.

Conclusion

Demands for reading, writing, and numeracy skills are intensified due to health-care systems' complexities, advancements in scientific discoveries, and new technologies. [18] Poor health literacy has been described as a "silent epidemic" which needs to be taken care of by professionals and policy makers in order to improve quality of health care delivery, reduce costs and disparities. [18] The ''roots of health literacy problems have grown as health practitioners and health care system providers expect patients to assume more responsibility for self-care at a time when the health system is increasingly fragmented, complex, specialized, and technologically sophisticated". [19] Thus dentists should identify patients who are having difficulty understanding and using dental health information and address their needs.

Considering the importance of measuring oral health literacy and the numerous instruments available for the same, it becomes imperative to determine the applicability of the particular instrument to be used in the population under consideration.[15] Thus, for further research in the field of oral health literacy in a culturally diverse country like India with people of different mother tongues, other instruments which measure oral health literacy rapidly and also test comprehension of the participants should be developed.

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A Study of Relationship between Maternal Height and Fertility: Indian Concern

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Abstract

Demographers, as well as public health professionals, have been quite interested to study the relationship between maternal body size and fertility. In this paper, the relationship between mother height, number of surviving children and parity is investigated for India and its major states. The mean number of children ever born is high in shorter mother and mean duration of first birth interval among the taller mothers is less than the shorter mothers. Taller women tend to have fewer children but more surviving children. The National Family Health Survey (NFHS) collect the information on fertility, infant and child mortality and the practice of family planning. For this study authors have used NFHS-4 data.

Key Words: *Fertility, maternal height, first birth interval, children ever born, surviving children, parity etc.*

Introduction

Human biologists are concentrated on describing the associations between fertility differentials with maternal shape and assessing the evolutionary implications of these associations.

Fertility is considered one of the most important factor in the study of population dynamics. It is determined by a complex set of biological, socio-economic, and psychological factors. So, social scientists and thinkers from different disciplines have made attempts to develop calibrate theories of fertility suited to their disciplinary approaches. For the convenience of researchers, these theories are grouped under three broad categories: biological theories, social or cultural theories and economic theories. Biological theories of fertility stimulated the concept that human growth is similar to other living beings. While, social theories tend to describe fertility in terms of a person's psychological attitude, which is determined by the prevalent culture. The socio-economic theories stress the significance of economic factors in the overall process of social change, which directs the fertility behaviour of a population. Among many biological, psychological, cultural and socio-economic factors, Davis and Blake[1](1956) had identified a set of eleven factors called intermediate variables which affect the process of reproduction either directly or indirectly. Bongaarts[2](1978) refined Davis and Blake's fertility framework and identified a smaller set of seven variables and named them proximate determinants of fertility; among them, four determinants were considered most important in terms of explaining variations in fertility levels of populations by Bongaarts[3](1982).

From the above theories, it has resulted that reproductive success is determined by numerous biological, behavioural, ecological, cultural and socioeconomic factors. Besides these factors, some studies suggest that the physical structure of a person may also affect fertility behaviour. The anthropometric measure which is used basically to measure growth, development and health status of an individual is the quantitative body measurement. Anthropometrics may be considered as a determining factor of fertility. Outside India, there have been quite a few studies which dealt with the correlation between fertility and physical structure, while in India there is a little literature in this context.

To find the impact of physical structure on fertility, early investigations were done by Davenport[4](1923) and Frassetto[5](1934); and observed that stockier couples had larger families than lean couples. Mitton[6](1975) observed significant differential fertility for height among males.

He indicated that men who were closer to mean height and weight (in some cases) had higher fertility than average. Vetta[7](1975) found significant relationships of fertility with height, weight and ponderal index.

In developed societies, some evidence about the association of large maternal size with higher fetal survival has been found by Bernard[8](1952) and Bressler[9](1962). In these studies, it is found that factors linked with tall statures such as enriched nutritional status and enhanced health care facilities, resulting in more successful pregnancies. Furusho[10] (1964) found that short couples had more live births than the tall in Japan, but there was no significant difference in the number of surviving children between tall and short. Among Peruvian urban poor, Frisancho et al.[11](1973) found that short mothers had a higher proportion of survivors per couple than tall mothers of similar age. Martorell et al.[12](1981) investigated the association between maternal stature, parity, offspring mortality and the number of surviving children. Sear et al.[13](2004) examined the relationship between height and reproductive success.

In this study, authors have made an attempt to examine the relationship between maternal stature and fertility in India.

Material and Method

The National Family Health Survey (NFHS) is a large-scale, multi-round survey conducted in a representative sample of households throughout India. Starting from the first round of this survey (NFHS-1) in 1992-93, four rounds of NFHS have been conducted in India till now. The recent round of National Family Health Survey (NFHS-4)[14] has been conducted in 2015-16. In this study, data related to fertility measures and anthropometric measures are taken from NFHS-4.

In this study, females of major states of India aged between 15 to 49 years have been considered as the target population. NFHS-4 collected anthropometric data on the height and weight of women which were used to calculate nutritional status measures. Females are categorized into two groups based on their height i.e. women having height ≤145.0cm, and having height >145.0cm. Literature review suggests about a number of important fertility parameters. Among them, four fertility parameters children ever born, first birth interval, most recent close birth interval and open birth interval have been considered for the study. Descriptive statistics have been used to get the estimated mean values of selected fertility parameters. The t-independent test is also used to compare the selected fertility parameters of shorter and taller mothers. The surviving ratio has been estimated to study the relationship between surviving children and maternal stature. Parity-wise proportion of females are also given for both groups to answer the question of whether parity, the number of previous deliveries, differs by mother's height.

Findings:

Table represents estimated means of selected fertility parameters i.e. children ever born, first birth interval, most recent close birth interval and open birth interval; for Indian females who are classified into two groups on the basis of their height which are height ≤145.0cm and height >145.0cm (shown in table). As it can be seen in the table, the mean number of children ever born is high in shorter mother in compare to taller. By considering females of all the major states of India, it is observed that the mean duration of the first birth interval among the tall females is less than the short females and statistically significant (p=0.000). Short females have a higher number of children ever born in comparison of tall females and it is statistically significant i.e. p=0.041 (shown in table).

The study shows that the mean number of surviving children of shorter females is lower than taller females in maximum states. It also indicates that taller mothers had a higher proportion of survivors (Mean number of surviving children/Mean number of children) when compared to shorter mothers. The analysis answers the question of whether one of the most meaningful measures of fertility, the number of surviving children varies with mother height. The table explains the proportion of females on each order of births and the analysis shows that the proportion of females at the first and second order is greater in taller and it starts decreasing after second order births. On another side, the proportion of females is more at high parity and it is less in the beginning orders.

Conclusion & Discussion

Over the decades, many public health professionals and demographers have tested the relationship between height and fertility. Many researchers found that mortality was significantly more for children of shorter women and they also observed a tendency for shorter women to have higher parities. Some researchers found no relationship between maternal stature and fertility

and few researchers found shorter females to have higher fertility.

In our study firstly, we studied the fertility parameters of shorter and taller mothers and found short females have more children ever born than tall females as well as longer duration of first birth interval. Secondly, we studied the mean number of surviving children and calculated survival ratio of children for major states of India and it has been observed that survival of children is low among short females in comparison of tall females. Earlier works by researchers on different populations show that mortality is greater in children of short mothers (Furusho[10],1964; Lechtig et al.[15,16]1975,1976). Last, it is observed that there is a tendency to have higher parities among short females. Survival of children may be caused due to deliberate efforts by short females to have more children to recompense for their child losses. Besides this, it is also known that after the death of a baby, the cessation of breastfeeding accelerates the return of the menstrual cycle which shortens the intervals between births (Martorell et al.[12],1981). This leads short females to achieve higher parities.

On the basis of the above analyses, we must conclude that there is a relationship of mother's height with fertility parameters, the number of surviving children is a function of height and mother height is related to the proportion of females at different parities. The taller mother tends to have fewer children but more surviving children, the survival of children is lower in shorter mothers. The study can be looked in light of the concern of public health professionals.

Table: Estimates of Fertility Parameters for Indian Females

Fertility Indicators	**Females having a height**	
	≤145.0cm	**>145.0cm**
Children ever born	2.00	1.87
	(t=1.841, p=0.041*)	
First birth interval (in months)	30.95	28.01
	(t=7.626, p=0.000**)	
Most recent close birth interval (in months)	37.77	37.73
	(t=-1.225, p=0.117)	
Open birth interval (in months)	99.84	104.00
	(t=1.155, p=0.131)	
Children survived	1.87	1.75
Proportion of children survived	0.91	0.94
Proportion of females on each birth order		
1	0.182	0.198
2	0.285	0.336
3	0.227	0.224
4	0.140	0.122
5	0.079	0.061
6	0.044	0.031
7	0.023	0.015
8	0.021	0.012
Note: t-test is applied by considering all the major states of India.		
* p-value is significant at α = 0.05 level of significance.		
** p-value is significant at α = 0.01 level of significance.		

Conflict of Interest: Nil.

Source of Funding: Datasets access is granted by DHS Program for research work.

Ethical Clearance: Not required as data source is mentioned above.

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Risk Factor Associated with Anthrax Transmission among the Tribal Communities of Odisha

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Abstract

Context: Anthrax is a neglected tropical disease caused by Bacillus anthracis. The condition primarily affects herbivores. Human contacts the natural disease directly or indirectly from animals or their products.

Aims: The purpose of the study was to assess the risk factors associated with the transmission of anthrax.

Settings and Design: A mixed methods study was conducted among the tribal population of Lamtaput block, Koraput from January to May 2018

Methods and Material: A set of pre-tested and validated structured and unstructured questionnaires were used in order to conduct the study.

Statistical analysis used: Statistical package for the social sciences(SPSS) version 15.0.

Results: Overall, the respondents heard about anthrax were found to be 62.91 %. 52.98% of respondents were aware anthrax can affect both humans and animals. The risk factors and risky behaviour were found to be statistically significant with a p-value of < 0.05. Nevertheless, the qualitative findings suggested the level of awareness varied among the respondents, and the cause behind transmission was due to consumption of dead carcasses. The quantitative data showed only 30.464 % of people vaccinated their animals, the qualitative interviews also proposed that fewer respondents vaccinated their animals, 45.69% of respondents threw the carcasses in the open air, 52.98 % respondents ate the meat while sharing it with the community members when an animal died. Food insecurity, poverty, geographical barriers were the reasons cited for consuming dead carcasses.

Conclusions: The cause of transmission of anthrax in Koraput was dead carcasses consumption, high-risk behaviour and practices such as eating, selling, or sharing were found to be common among the respondents. These risk factors are influenced by the low socio-economic status, education level, lack of proper health education messages and poor veterinary services

Key-words: Anthrax, Awareness, Exposure practises, Risk factors, Tribal communities.

Introduction

Globally, anthrax accounts for 20,000 to 1,00,000 of human cases where livestock are not vaccinated, whereas due to underreporting and geographical distributions the actual incidence is not known in India[1]. 18 out of 30 districts in the state have witnessed outbreaks of anthrax as many as 61 times during the last ten years affecting 750 people out of that 418 had died[2]. According to Department of Animal Husbandry, Odisha, every year number of anthrax outbreak are reported from Koraput district[3]. Anthrax outbreaks are an annual phenomenon in Odisha, especially in the region of Koraput[4]. A sizeable portion of Koraput district's land area is covered with forests; the soil has good moisture which creates

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favourable condition for anthrax spores to be dormant and be activated to give rise to transmission.

In addition to these eco-environmental factors social factors plays a vital role in anthrax disease transmission[5]. The purpose of this study was to assess the social risk factors associated with the transmission of anthrax in the tribal population of Koraput district of Odisha

Material and Method

Subjects and Methods:

A mixed method study was conducted in which case, survey was conducted with in-depths and key informants' interviews from January 2018 to March 2018 Lamtaput block of Koraput district, Odisha. The study included males/females aged 18-59 years, medical workers and veterinary officers, who were willing to participate in the study. This was done in order to conduct a deeper understanding of the underlying factors which influences the anthrax transmission in the community. The study had 2 components

Quantitative questionnaires

Data analysis

Koraput districts has 14 blocks, out of which Lamtaput is one of the most endemic for anthrax, and frequent outbreaks are reported every year. The block is bordered with Boipariguda on the north west and Nandapur on the south east, both of them the other two most endemic anthrax blocks of Koraput. Lamtaput block had a total population of 59873 in 2011 of which 46% were tribal[7]. The block had a livestock population of 27088 by the last animal census. We took a sample spread across 12 tribal villages across the length and width of the block recruiting a total of 150 households to conduct this cross sectional survey to assess social risk factors for anthrax in the area.

We used a questionnaire to assess prevalence of known risk factors that favour anthrax transmission in animals and humans and supported the same with key depth interviews to look into the perceptions and beliefs determining the presence or absence of these risk factors.

The administrative permission to conduct the study was obtained from the Chief district medical officer and District collectorate. Ethical permission was obtained from ethical committee of the Kasturba Medical College, Manipal Academy of Higher Education, Manipal. We took informed consent of the interviewee and each interview was conducted in the presence and with the help of grass roots health personnel.

Demographic tables were prepared where the categorical variables were expressed in frequency and percentage and the continuous variables. Fisher exact test and Chi-square test was performed to assess strength of association of variables the descriptive data was coded and entered and analysed in SPSS version 15.0. Thematic analysis was used to analyse the qualitative data, firstly, the data was translated into the English language, then coding of the data was done, then the code was translated to the category, and finally the category was translated into themes

Findings

Sixty percent of our respondents were in the age group of 28 to 48, 80% were male and 4% completing school education. Ninety percent of them were currently married and 80% of them farmers by occupation, an additional 10% agricultural labourers. Most of them are aware that the anthrax disease is there and it affects both animals and humans and also that the animals bleed from natural orifices at death. Most of the respondents said they are not visited by veterinary health personnel and mostly depend on traditional (desi) treatment or that of quacks for treating their dead animal. Only 30% allowed their livestock to be vaccinated against anthrax in the last round. Though some people discarded a dead carcass by throwing it outside the human habitations, most of them believed there is no harm in consuming them. They justified it with their hunting festivals when they are allowed to hunt and eat bush meat. On their own health seeking behaviour, they preferred the village healers or quacks rather than reach the local health facility, as they do not have trust in the health facilities or personnel The perception of the villagers substantively varied from that of the local health care workers, who see the villagers stubborn on keeping to their own beliefs and practices and not listening to health advice, even when they reach them. During the survey a few households were witnessed drying salvaged carcass meat for preservation for future use.

Table 1: Awareness Related to Anthrax

Variables	Category	n (%)
Ever heard of anthrax	Yes	95 (62.91)
	No	56 (37.09)
Awareness about who can be affected	Human/Animals/Both	80(52.98)
	Don't know	71(47.02)
Awareness about vaccination as prevention	Yes	52(34.43)
	No	99(65.56)
Major sources of information	Mass media	96(63.57)
	Personal	55(36.42)

Table 2:Risk factors and Disposal practises

Risk factors	Risk behaviour		Chi-square	P value
	Eat the meat	Throw (open air)		
Sex				
Male	71	52	1.592	0.001
Female	18	10		
Occupation				
Employed	79	63	1.606	0.001
Un-Employed	3	6		
Education				
No Schooling	42	44	1.620	0.001

Table 3:Relationship between livestock keeper and loss of cattle due to anthrax

Livestock Keeper	Loss cattle due to anthrax		Chi-square	P value
	Yes	No		
Yes	100(92.6)	36(83.7)	**1.618**	**0.001**
No	8(7.3)	7(16.3)		

Table 4 : Risk factors and Exposure practises

Risk factors	Risk behaviour		Chi-square	P value
	Handling	Cooking and others		
Sex				
Male	71	52	1.592	0.001
Female	18	10		
Occupation				
Employed	80	62	1.625	0.001
Non- Employed	6	4		
Education				
No schooling	36	47	1.624	0.001
Schooling	29	39		

1. Word limit 2500-3000 words, MSWORD Format, single file

2. Please quote references in text by superscripting

Conclusion

The study findings showed that general awareness among the communities' members varied, also the vaccination rates were low due to numerous challenges, cultural beliefs, myths and perception which influences how community treats the dead carcasses. the high-risk behaviour and practices such as eating, selling, or sharing were found to be common among the respondents. These risk factors are influenced by the low socio-economic status, education level, lack of proper health education messages and poor veterinary services.

A backward community that is deprived of awareness and modern interventions to combat an easy to prevent and difficult to cure disease and its transmission suffer in isolation because of repeated outbreaks of anthrax that has become endemic in the region. This calls for a wider intervention involving non health line departments to stop the transmission cycle of anthrax in Odisha.

Conflict of Interest – Nil

Source of Funding-Nil

Ethical Clearance – Kasturba Medical College, Manipal Academy of Higher Education, Manipal

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Assessment of Risk Factors For Diabetes among Bank Employees Using Indian Diabetes Risk Score: A Cross Sectional Study

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Abstract

Introduction: Diabetes is an "iceberg" disease and is one of the major causes of premature illness and death worldwide. From 108 million in 1980, the number of people living with diabetes has increased to 422 million in 2014. In india it was the 7th biggest cause for early death in 2016. There are many screening tools available to identify the risk for diabetes, of which IDRS tool is one of them.

Objective: To assess risk of diabetes mellitus among selected bank employees using Indian diabetes risk score.

Methodology: A cross sectional study was conducted over a period of 2 months (February to march 2019) among 205 employees of 4 branches of a selected bank. Data was collected by purposive sampling using a pre-tested, semi-structured questionnaire and IDRS scale. Clinical examination and GRBS was carried out. Chi-square test was used as test for association.

Results: Among 205 respondents, IDRS score showed that 61% belonged to high risk category, 25% to moderate risk & 14% belonged to low risk.

Conclusion: Present study showed 61% to be in high risk category for DM; it also revealed significant association between overweight and high IDRS. Age, abdominal obesity in males, family history of diabetes and physical activity were significantly associated with high IDRS. Early screening aids in early diagnosis and treatment which can reduce the burden of DM.

Keywords: *IDRS, Diabetes Mellitus, Bank employee, BMI, GRBS.*

Introduction

Diabetes Mellitus' a disease known since ancient times finds its description in vedic literature being described as 'Madhumeha' meaning 'honey-urine'.[1]

World Health Organization (WHO) defines the term diabetes mellitus as- 'a metabolic disorder of multiple etiology characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both.[1] Increasing at a rapid rate this disease is posing a major public health challenge. A disease finding its description in vedic literature, WHO estimates around 422 million to be affected with diabetes around the world.[2] The Eastern Mediterranean Region and the Region of the Americas have highest prevalence (11% for both sexes) and Western Pacific Regions & WHO European regions (9% for both sexes) have lowest.

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The prevalence that was 2.3% in urban areas in 1970's according to ICMR study has currently risen to 12-19% in recent years.[4,5] The most recent estimates by ICMR show that there are 66.58 million cases and 2.26 million DALYs loss due to diabetes.[6] According to the Diabetes Atlas 2013 published by the International Diabetes Federation, the number of people with diabetes in India currently is 65.1 Million, which is expected to rise to 142.7 million by 2035 unless urgent preventive steps are taken[7.] The elimination of risk factor, early diagnosis and adequate treatment can reduce the risk of disease. Sedentary lifestyle, work pressure increasing stress amongst individuals are well known factors in the causation of disease. Since bank employees come under this group, the present study has been conducted to assess their risk for diabetes.

Objective

To assess risk of Diabetes mellitus among selected Bank Employees using Indian Diabetes risk score.

Methodology

A cross sectional study was carried out over a period of 2 month (February to March 2019) among employees of 4 branches of Karnataka Bank in Mangalore city, Karnataka.

After obtaining the written permission from managers of respective branches subjects were studied individually in their leisure time with informed consent. Employees who were present on the day of visit and who were willing to participate were enrolled for the study. Those with pre existing diabetes (Self-reported) were excluded. A total of 205 employees were available for the study. Sampling technique used was purposive sampling.

A pre-tested, semi-structured questionnaire was used to elicit socio-demographic parameters like age, sex, marital status, education, occupation, per capita income; IDRS scale [8] having parameters including Age in years, family history, physical activity and abdominal circumference was used.[8] Examination in the form of BP, PR, Height and Weight, GRBS was tested using glucometer. BMI was also calculated.

Ethical Clearance was obtained from institutional ethical committee.

Certain definition used in the study[10]

1. **Age:** Age was recorded in completed years as revealed by subjects and categorized into 3 groups; age <35 years was given a score of 0, 35- 49 years as 20 and >=50 years as 30.

2. **Waist circumference:** Males: Individuals with waist circumference <90cm were given a score as 0, 90 – 99 cm as 10, and those with >=100 cm as 20. Females: Individuals with waist circumference <80cm were given a score as 0, 80 -89 cm as 10, and those with > 90 cm as 20.

3. **Family history of diabetes:** Individuals with no family history of diabetes were given score as 0, those with one diabetic parent as 10 and those with both diabetic parents as 20.

4. **Physical activity:** Individuals were given a score as 0 if they did leisure time exercise and in addition had physically demanding work in their occupation; individuals who either did exercise or performed physically demanding work were given score as 20 and the individuals who neither did any exercise or who are leading a sedentary lifestyle were given score as 30.

The total scores were added up and the subjects were classified as high risk, moderate

risk and low risk, based on the IDRS as follows – < 30 as low risk, score 30-50 as

moderate risk and score 60 and above as high risk.

5. **GRBS:** Cut of 110mg/dl was used as cut of to devide the study subjects into low risk & high risk.[11]

Statistics:

Data was entered in excel. Results presented as percentages and proportions. Chi-square test was used as test for Association

Results

Mean age of the study subjects was 45.45±11.98. Males 159 (74.6%) out numbered females 52 (25.4%). In our study about 59 (28.8%) were in the age group of <35, 74 (36.1%) were in the age group of 35-49 yrs and about 72 (35.1%) were aged >=50yrs. Most of the employees 152 (74.2%) were Professional. By IDRS, most of the subjects, 125 (61%) were having high risk for type 2 DM. About 51 (25%) were at moderate risk and 29 (14%) were at low risk of developing type 2 DM. (Table 2).

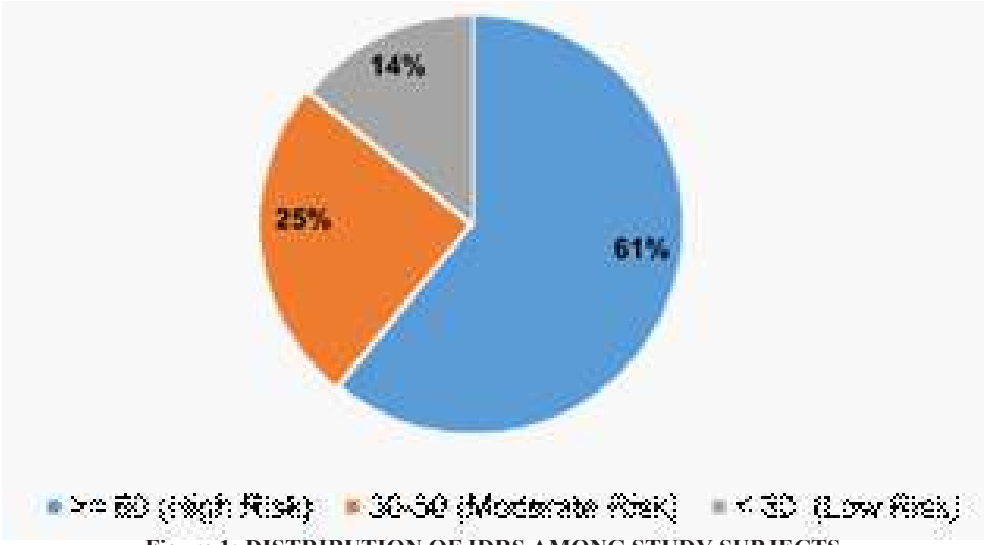

Figure 1: DISTRIBUTION OF IDRS AMONG STUDY SUBJECTS

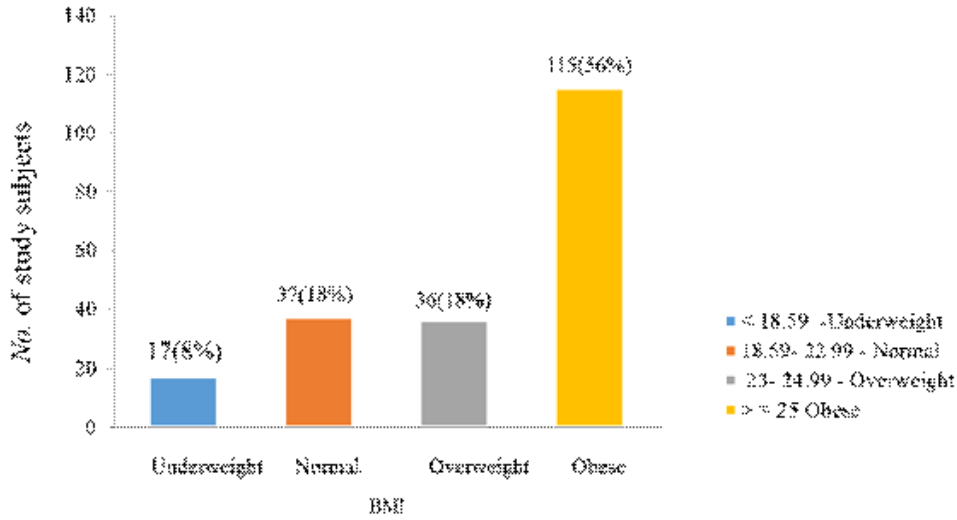

Figure 2: DISTRIBUTION OF STUDY SUBJECTS ACCORDING TO BMI

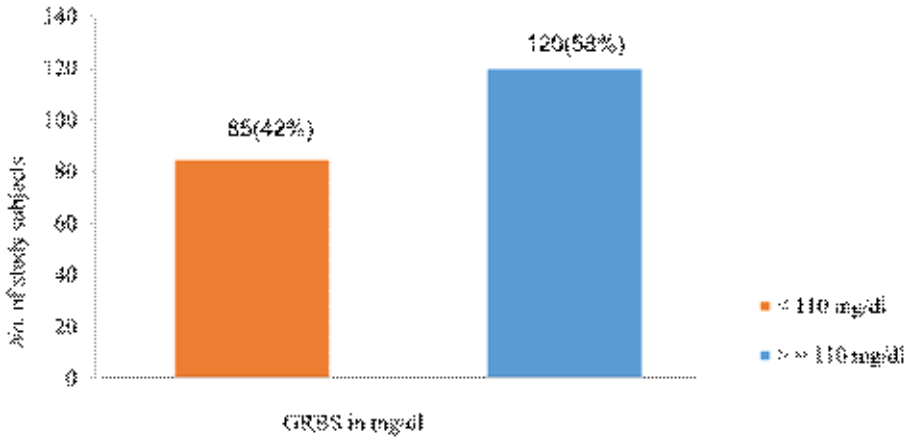

Figure 3: DISTRIBUTION OF STUDY SUBJECTS ACCORDING TO GRBS

Table.1. Distribution of study subjects in accordance with parameters of IDRS.

Variables **Low risk**		**IDRS Score Number (%)**			
		Moderate risk	**High risk**	**Total**	
Abdominal Obesity in Male (cm)	< 90	10 (42)	7 (29)	7 (29)	**24(100%)**
	90 – 99	**7(9)**	**22(27)**	**51(64)**	**88(100%)**
	>= 100	**1(2)**	**9 (18)**	**39(80)**	**49(100%)**
Abdominal Obesity in Female (cm)	**< 80**	**7 (46)**	**4 (27)**	**4 (27)**	15(100%)
	80 – 89	4 (21)	5 (26)	10 (53)	19(100%)
	>= 90	0 (0)	4 (23)	14 (77)	18(100%)
Age (in years)	< 35	26 (44)	28 (47)	5 (9)	59(100%)
	35 – 49	3 (4)	17 (23)	54 (73)	74(100%)
	>= 50	0 (0)	6 (8)	66 (92)	72(100%)
Physical activity	Exercise+ Strenuous Work	8 (42)	9(47)	2 (11)	19(100%)
	Exercise or Strenuous Work	18 (16)	29 (25)	67 (59)	114(100%)
	No exercise & sedentary work	3 (4)	13 (18)	56 (78)	72(100%)
Family History	No Family History	19 (23)	27 (32)	38 (45)	84(100%)
	Either parent	9 (11)	22 (26)	54 (63)	85(100%)
	Both parents	1(3)	2 (5)	33 (92)	37(100%)

Table 2: Association between IDRS and Clinico- Social-Factors

Variable		**IDRS Score (%)**			**P value**
		Low risk	Moderate risk	High risk	
Sex	Male	18(62%)	38 (74.5%)	97(77.6%)	0.223
	Female	11(38%)	13(25.5%)	28(22.4%)	
	Total	29(100%)	51(100%)	125(100%)	
BMI	Underweight	2 (7%)	5 (10%)	10(8%)	0.083
	Normal	10 (35%)	8 (16 %)	19 (15%)	
	Overweight	8 (28%)	7 (14%)	21(17%)	
	Obese	9 (30%)	31 (60%)	75 (60%)	
	Total	29(100%)	51(100%)	125(100%)	
Abdominal Obesity in Male (cm)	<90	10 (55.55%)	7(18%)	7 (7%)	0.000
	90 -99	7(39.88%)	22(58%)	51(53%)	
	>100	1(5.55%)	9 (24%)	39(40%)	
	Total	18(100%)	38(100%)	97(100%)	
Abdominal Obesity in Female (cm)	<80	7 (64%)	4 (31%)	4 (14%)	0.26
	80- 89	4 (36%)	5 (38%)	10 (36%)	
	>90	0 (0%)	4 (31%)	14 (50%)	
	Total	11(100%)	13(100%)	28(100%)	
Age (in years)	<35	26 (90%)	28 (55%)	5 (4%)	0.000
	35-49	3 (10%)	17 (33%)	54 (43%)	
	>50	0 (0%)	6 (12%)	66 (53%)	
	Total	29(100%)	51(100%)	125(100%)	
Physical activity	Exercise+ Strenuous Work	8 (28%)	9(18%)	2 (2%)	0.000
	Exercise or Strenuous Work	18 (62%)	29 (57%)	67 (54%)	
	No exercise & sedentary work	3 (10%)	13 (25%)	56 (44%)	
	Total	29(100%)	51(100%)	125(100%)	
Family History	No Family History	19 (66%)	27 (53%)	38 (30%)	0.000
	Either parent	9 (31%)	22 (43%)	54 (43%)	
	Both parents	1(3%)	2 (4%)	33 (27%)	
	Total	29(100%)	51(100%)	125(100%)	
GRBS	<110	16 (55%)	21(41%)	48(38%)	0.255
	>110	13 (45%)	30(59%)	77(62%)	
	Total	**29(100%)**	**51(100%)**	**125(100%)**	

Discussion

There is a clear association between increasing age and greater diabetes prevalence. Among 205 respondents, IDRS score was found to reveal high risk in the age group >35 years (96.34%) and in patients with high BMI (56%). Overall, 61% of the patients had high risk of Diabetes. Higher the age group more was the risk score. The National Institute for Health and Care Excellence (NICE) states that being older than 40 years, or older than 25 years for some black and minority ethnic groups, is an important risk factor for developing type 2 diabetes.[12]

An increase in waist circumference is seen as an important risk factor for developing diabetes with a gender based difference where in men are seen to have a higher risk with a waist circumference of 94 – 102 cm and Women are at higher risk if the waist circumference is 80 – 88cm.[13] In our study, majority of male 52 (24 %) and females 14 (6 %) were seen in group 2 i.e., males (90-99cm) and females (>90) and these showed to have a higher risk for diabetes though it was significant only in males($p = 0.00$). This could be because of the risk jobs that most have at Banks which invariably lessens physical activity. Over the past 4 decades, a huge number of the working population has shifted from manual labor associated with agriculture sector to physically less demanding office jobs.[14] It has been observed in other studies that prevalence of diabetes is 3 times higher in individuals with light physical activity compared to those doing heavy physical activity.[14] In our study 57% of individuals involved in exercise or strenuous work belonged to moderate risk and 54% in high risk group which was also significant ($p = 0.00$). Strenuous work may have added to stress factor contributing to higher risk . Similarly, 25% and 44% of individuals following a sedentary pattern showed to have moderate and high risk scores respectively. Genetic susceptibility and common environmental factors including cultural background are factors that determine the family history for a disease specially so in diabetes.[15] The disease risk increases to 40% when a 1st degree relative has history of diabetes.[15] In our study, 85 (41.5% %) subjects had positive family history of type 2 DM in one parent, 33 (16 %) had positive history in both parents of whom 125 (61 %) were in high risk group, 51 (25 %) of them were in moderate risk group and 29 (14 %) were in low risk group and these factors were significantly ($p = 0.00$) associated with higher risks according to IDRS. In a similar study by Raja Subramanian et al[16] it was seen those with family history showed a higher risk for diabetes. In our study, 120 individuals had a GRBS reading of > 110 mg/dl. Acoording to Reshma S Patil etal[18] study showed that those individuals having GRBS of more than equal to 110mg/dl have recommended oral glucose tolerance test to detect status of diabetes in future. In our stud showed of the 120 individuals who had a GRBS reading of more than 110 mg/ dl 59% of them were belonged to moderate risk and 62% were in high risk group based on IDRS. Though not significantly associated it can be taken as ameasure for risk scoring for diabetes.

Conclusion

IDRS is a simple and cost-effective tool to screen and assess people at high risk for DM. The present study brought out 61% of Bank employees to be at high risk & also revealed significant association between BMI and a high risk score of DM. Due to sedentary nature of work for most bank employees, they are at risk of developings a disease like diabetes. Our study found 61% of the study population at high risk for DM using IDRS. IDRS can be used as a baseline screening tool to assess the risk of individuals and take measures accordingly.

Early screening aids in early diagnosis and treatment which can reduce the burden of DM.

Limitations of Study: Sample size was small for want of time. Blood Glucose levels of subjects at high risk were not assessed because of cost factor.

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Emotion Dysregulation in Patients with Major Depressive Disorder and Borderline Personality Disorder

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Abstract

Emotional dysregulation is a central topic of interest in many clinical studies. It plays a vital role in making or breaking interpersonal and interpersonal relationships in clinical populations as well as healthy controls. This study seeks to investigate the nature, intensity and extensity patterns of emotional regulation in patients diagnosed as major depression (N: 254) and borderline personality disorder (N: 69). By using a one-shot cross sectional purposive sample survey design, this hospital-based study targeted a random sample of subjects from both gender between 18-30 years. Following clinical interviews and diagnosis as per the chosen inclusion and exclusion criteria, participants were recruited based on ICD-10 criteria and after they secured a minimum cut-off score on McLean's Screening Instrument for Borderline Personality Disorder and Hamilton Depression Rating Scale. The selected participants were administered Difficulties in Emotion Regulation Scale and Cognitive Emotion Regulation Questionnaire. Results show significantly high scores on emotion regulation in patients with borderline personality disorder than major depressive disorder ($p:<0.05$). These differences are maintained across all domains except for cognition mediated areas like 'awareness', 'self-blame', 'acceptance', 'rumination', and 'positive refocusing'. Associated variables like genderand marital status appear to influence only some aspects of non-cognitive emotional dysregulation. The findings are discussed along with their implications for therapy in the context of cultural factors unique to Indian settings.

Key Words*: Emotional dysregulation, Major Depression, Borderline Personality Disorder, Self-Blame, Rumination.*

Introduction

Emotional dysregulation is a term used in mental health settings to refer to emotional responses that are poorly modulated. It may manifest as anger outbursts, acts of aggression or destructiveness against self or others, and can result in a breakdown of interpersonal relationships. Emotional dysregulation is implicated as being at the core of major depressive disorder and borderline personality disorder. It is shown that in psychiatry disorders including anxiety, depression, eating disorderand substance-related disorders most commonly used strategy out of six strategies (problem solving, reappraisal, acceptance, suppression,avoidanceand rumination) was seen for rumination. Avoidance, problem solving and suppression were used with medium frequency where as reappraisal and acceptance used least. [1]

It is shown that individuals having major depressive disorder less differentiated emotional experiences than healthy controls but only for unhelpful emotions.[2] Further, emotion regulation difficulties in female patients with major depressive disorder are found to be greater in comparison to normal healthy controls [3]. Although there is extensive research exploring the relationships between these processes and depression, the research on other unhelpful emotions is sparse.

Based on self-report measures, investigators have identified a triad of emotional functioning-emotion

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dysregulation, distress tolerance, and experiential avoidance in young adult out patients with borderline personality disorder [4]. Emotional reactivity to social rejection and negative evaluation in patients with borderline personality disorder was found to be higher than in comparable healthy controls [5]. Taking these facts in to account, our aim is to identify emotion dysregulation in major depressive disorder and borderline personality disorder, and compare emotion dysregulation in major depressive disorder and borderline personality disorder. Also we investigate emotion dysregulation in major depressive disorder and borderline personality disorder in relation to key socio-demographic correlates like gender, marital status, and occupation.

Material and Method

The clinical samples were recruited based on the [6]Diagnostic Criteria for Research-10 . 323 participants with the age range of 18-30 were recruited out of which 69 borderline personality disorder and 254 major depressive disorder. Those scored 7 are more on MSI-BPD[7] and HAM-D were included in the study.[8] Patients with intellectual disability, psychosis, bipolar disorder, substance dependence or abuse disorder and presence of any serious physical disease, head injury and neurological disorder. Personal details were collected using a socio-demographic data sheet. There were statements on assuring confidentiality, leaving choice of participation to the respondents, and acknowledging ones willingness or otherwise to participate in the study.

Self report questionnaires such as MSI-BPD and HAM-D were used to screen borderline personality disorder and measure depressive disorder patients [9,10] . Difficulties in Emotion Regulation Scale was used to measure difficulties in emotion regulation difficulties in the following six domains of emotion regulationNon-acceptance, Goals, Impulse, Awareness, Strategies and Clarity. [11] Similarly cognitive emotion regulation questionnaire was used to measure cognitive emotion regulation difficulties in nine dimensions present in the scale are self blame, blaming others, acceptance, refocus on planning, positive refocusing, rumination, positive reappraisal, putting into perspective and catastrophizing.[11]

Results

(i) **Emotion regulation in major depressive disorder and borderline personality disorder:**

Results of comparative overall scores on emotion dysregulation in persons with major depressive disorder and borderline personality disordershow gross difficulties in emotion regulation for both the clinical populations. If the patients with borderline personality disorder (N: 69; Mean: 103.48; SD: 7.72) score in 'moderate-severe' range of norms on DERS, the sample with major depressive disorder do not lag much behind (N: 254; Mean: 93.67; SD: 8.60). The same is true for the trends on cognitive emotion regulation between the two groups.

Table 1: **Distribution of Mean Scores and SD across Tests & Conditions**

Tools	Items	Score	BPD (N: 69)	MD (N: 254)	Probability
DERS	36	36-180	103.48 (7.72)	93.67 (8.60)	t: 8.5809; Df: 321; p: 0.0001
CERQ	36	36-180	100.99 (7.32)	95.70 (7.60)	t: 5.1670; Df: 321; p: 0.0001

(KEY: BPD: Borderline Personality Disorder; MD: Major Depression)

(ii) **Domain-wise profiles in emotion regulation between major depressive disorder and borderline personality disorder**

Wherein a domain-wise analysis of score profiles is undertaken on DERS, the patients with borderline personality disorder consistently score high across all areas except 'non-acceptance' (N: 69; Mean Score: 16.28; SD: 2.44) wherein those diagnosed as major depressive disorder score relatively lower (N: 254; Mean Score: 15.15; SD: 1.87).

Table 2 : Distribution of Mean Scores and SD across Domains on DERS

Sample	**N**	**NA (6)**	**G (5)**	**ID (6)**	**A (6)**	**S (8)**	**C (5)**	**Total (36)**	**Probability→**
BPD	69	16.28 (2.44)	14.93 (2.20)	20.26 (4.22)	15.14 (1.82)	24.03 (2.89)	13.35 (1.79)	103.48 (7.72)	<0.001; VHS;
MD	254	15.15 (1.87)	14.67 (2.18)	15.88 (3.60)	14.97 (2.20)	20.21 (2.31)	12.90 (1.86)	93.67 (8.60)	<0.001; VHS;
Probability↓		<0.001	<0.001	<0.001	>0.05	<0.001	<0.001		
		VHS	VHS	VHS	NS	VHS	VHS		

[Key: NA: Non-Acceptance; G: Goals; ID: Impulsive Difficulty; A: Awareness; S: Strategies; C: Clarity][Number of items under each domain is given in parenthesis]

Domain-wise comparative analysis of scores on CERQ between the two clinical groups (Table 3) shows that the predominant aspects of cognition involved in emotion regulation that are affected is acceptance, rumination, self-blame, positive reinforcing and refocusing on planning, which are all mostly on the higher side for patients with borderline personality disorder than for those with major depressive disorder.

Table 3: Distribution of Mean and SD Scores across Domains on CERQ

Scales	**Items**	**BPD (N: 69)**	**MD (N: 254)**	**Probability →**
Self-blame	4	14.26 (2.54)	13.69 (2.13)	t: 1.90; p: 0.05; S;
Acceptance	4	16.94 (2.39)	15.98 (1.61)	t: 3.94; p: 0.001; VHS;
Rumination	4	13.41 (1.95)	11.44 (1.89)	t: 7.60; p: 0.001; VHS;
Positive Refocusing	4	13.65 (2.68)	10.66 (2.14)	t: 9.69; p:0.000; VHS;
Refocusing on Planning	4	9.46 (1.82)	9.96 (1.55)	t: 2.25; p: 0.03; S;
Positive reappraisal	4	8.58 (1.631)	8.84 (1.38)	t: 1.32; p: 0.19; NS;
Put into perspective	4	8.30 (1.49)	8.36 (1.55)	t: 0.27; p:0.78; NS;
Catastrophizing	4	9.22 (1.93)	9.33 (1.96)	t: 0.43; p: 0.67; NS;
Other-blame	4	7.49 (1.72)	7.61 (1.36)	t: 0.596; p: 0.55; NS
Probability↓				

(KEY: BPD: Borderline Personality Disorder; MD: Major Depression)

(iii) Distribution of profiles in emotion regulation between major depressive disorder and borderline personality disorder in relation to key socio-demographic variables

Gender wise differences within each clinical condition (p: <0.001). The males with borderline personality disorder score significantly high on the domain of 'Impulsive Difficulty' (N: 54; Mean: 20.77; SD: 4.20) than the females in the same group (N: 15; Mean: 18.40; SD: 3.88) (p: <0.001). A similar trend is seen also for the patients with major depressive disorder (p: <0.001).

Analysis of scores across domains on CERQ between the two clinical populations based on gender variable shows no statistically significant differences except for 'Other-blame' condition. There are statistically significant differences in all the domains on DERS for major depressive disorder as well as borderline personality disorderin relation to three categories of the occupational variable (p: <0.001).

On the CERQ, there is a clear pattern of nil significant differences across its nine different scales for patients with borderline personality disorder as compared to significant differences at least with respect to a few sub-scales for those with major depressive disorder in relation to occupational variable. Thus, respondents with major depressive disorder show significant elevation of emotion regulation scores on domains like positive reappraisal, catastrophizing, positive refocusing, refocusing on planning and other-blame tendencies for this variable (p: < 0.05). This means that clients with major depressive disorder still hold tendencies to think of pleasant things or experiences, or think of how best to cope with the situation.

The next series of test wise domain analysis was undertaken for the binomial marital variable: married vs. unmarried. There are statistically major differences for distribution of mean scores across all domains on DERS for both groups of sample with major depressive disorder as well as borderline personality disorder in relation to marital variable (p: < 0.001). On the CERQ, the distribution of scores across domains shows nil significant differences across all its nine different scales for patients with borderline personality disorder as compared to significant differences in all except one sub scale of catastrophizing sub-scales for those with major depressive disorder in relation to marital variable. Thus, the married respondents with major depressive disorder show significantly less elevation of scores on the domains of catastrophizing only (p: > 0.05). This means that married clients with major depressive disorder maybe receiving sufficient supports to buffer such attribution tendencies to cope with their predicament.

Discussion

Depression is found to be greatly associated with difficulties in cognitive control and, especially, with difficulties in inhibiting the processing of unhelpful material. Evidence appears to favour greater rumination in borderline personality disorder with also a different course or illness trajectory and treatment pathway as compared to major depressive disorder. It is noted that major depressive disorder can co-occur with borderline personality disorder. Many patients with borderline personality disorder often present depressive symptoms. It is postulated that depressed individuals are characterized by emotional inertia, while individuals with borderline personality disorder are characterised by emotional instability. Both groups have been found using more maladaptive affect regulation strategies than healthy controls [12]. The essential findings in the present study related to high scores on emotion regulation for patients with borderline personality disorder than those with major depressive disorder especially in cognitive related domains 'self-blame,' 'acceptance,' 'rumination,' 'positive refocusing,' and to a lesser extent on 'refocusing on planning' has critical implications for treatment.

Both the clinical conditions appear to be equally affected for emotion dysregulation in the domains of 'putting into perspective','positive reappraisal,'other-blameand 'catastrophizing',respectively. Similar trend are reported in previous studies [13,14,15] . Also, patients with borderline personality disorder are found to have poor social problem-solving skills that may disturb their emotion regulation [16] The high borderline personality disorder individuals demonstrated greater increase in unhelpful emotions, shame and ager in response to the social rejection/ compared with the annoying arithmetic task [17] .

Gender is most frequently discussed variable for emotion dysregulation in clinical conditions. Despite this lay conviction, empirical evidence on gender differences in emotional responding is mixed. A limitation of these studies is that they are all based on self-reports and is

vulnerable to the effects of gender stereotypes. Future studies must distinguish emotional reactivity and emotion regulation. There is also a cultural dimension to emotion regulation that is emerging in this study. Collectivistic cultures as in India, may recommend less expression of emotions for fear of upsetting social harmony [18,19]. Occupation has not emerged as a critical variable for emotion regulation in major depressive disorder and borderline personality disorderin this study. Being in relation or marriages in which one or both partners have borderline personality disorder can be tumultuous, conflict-laden, and dysfunctional. It is likely to be an everyday challenge for persons with major depressive disorder and borderline personality disorder to deal with negative emotions at work. However, more research is required to conclude emphatically on this variable of emotion regulation in these clinical conditions.

Conclusion

In conclusion, this study sought to inquire the nature, intensity and extensity patterns of emotion regulation in patients diagnosed as major depressive disorder and borderline personality disorder. By using a one-shot cross sectional purposive sample survey design, this hospital-based study targeting a random sample of subjects from both gender between 18-30 years has significantly high scores on emotion regulation in both the clinical populations with marked differences across specific cognition mediated domains and in relation to associated variables like gender and marital status appear to influence only some aspects of non-cognitive emotional dysregulation. These findings have implications for therapy in the context of cultural factors unique to Indian settings.

Conflict of Interest statement: Nil

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A Study on Stress Management and Health Impacts on Women Employees of it Sectors in Chennai City

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Abstract

Women are playing diverse roles in the family and in the work place. Women experience stress and many health impacts in both sides from psychological tension and physical harassment at workplaces, apart from the common job stress. Information Technology (IT) companies is one of the significant employee generating industry in the worldwide condition where the people are participating. In these companies women advanced into the corporate workforce, however without need of full improvement of their abilities and ascend for authority positions because of stress. Globalization of economy have constrained our IT workforce to concern more in winning the ability individual and India's informed IT proficient women are a noteworthy resource that should never again be underestimated and under-used. This paper depends on discoveries from research studies on Indian Information Technology Industry. It gives a diagram of the difficulties and stress observed by women who are working in IT companies associations. Here discussion is about what changes are required to manage stress among women and what is being done to get the prescribed procedures for Information Technology industry in India. The present paper features the adapting systems that can be chosen to additionally precede corporate journey to gender inclusion and the development of women in the society.

Keywords: *Stress management, IT companies, women, economy, health, employees*

Introduction

In the recent years the developments in the areas of communication, power and software developments is constantly increasing in India. Information technology industry has already established itself becoming a popular across the globe. In today's context the word stress we often listen everywhere in this globalized world, stress are often described as feelings of being under too much physical, emotional and mental resulting into tension.

Stress at work place is common aspect. Now a day jobs are more associated with stress. The working persons come under stress and suffer from its consequences. In reality the stress is faced by everyone in everyday life. Some people have high tolerance for stress and succeed well in the expression of numerous stressors in the environment. Stress is a wide phenomenon as it appears to exist in human beings, animals and even in metals.

However, this study is about women stress with unique focus on the work stress in IT companies. Numerous individuals think they comprehend stress, but actuality stress is perplexing and frequently misjudged. Our Information Technology industry has a name for it 'Burn out stress disorder', which is seen usually among women working in IT companies. Technological and administrative changes in the IT companies in India made a sharp and genuinely sudden increment in the interest for female laborers (Vijayakumar Bharathi, 2015)[1] Therefore stress among women employees in Information Technology industry is a contemporary issue to talk about and to hit upon on explanation of this issue.

Women Employees

In the modern world, women no longer wait behind in terms of career. The IT has been noticed that one of the industry, which has witnessed high development for women and helped them more. Though, still now women are expected to do multi tasking. The Nature has given

women too much supremacy but, the law gives them too little as there is no detach in support of women to fill the gap during their intrinsic responsibilities. Women themselves support the idea of men as a pioneer which cannot be broken by the women to make a position in the male-dominating corporate world.

Women in India is changing the view of them in the society, from just a housewife to CEO of an organization, she not only has acquired skills and abilities to being an ideal housewife but being at same time competition with life partner. Now, women are transforming themselves with their dream career and this is the new transmission of women but, women are suffering from numerous symptoms of stress those who are working. They have to fulfill the various demands at both workplace and home. Today, to create a balance with occupational life as well as their personal life at home with their children maximum married couples are working at equal level to live a stable life. But it is very difficult for the women as she has to perform various tasks right from a cooking, as a tutor to their children, a housemaid who take care and fulfill requirements of the home. So, a working woman is highly stressed and restless.

Health impact

Anxiety and depression are types of health impact that affects a mental status of a person. It can affect thoughts, feelings, behavior, and overall health. Normal feelings fall along a range from lower level to higher level. It is regular to react to suffering in life with sorrow and obscurity. But when these feelings create impact on a person from performing their everyday activities and the reality of a person's life, they are considered indications of Health impact (Eleni Kampanellou, 2016)[2].

Type of stress

Stress has often been misunderstood to be negative but, some people recognize the significance and effectiveness of positive stress. In daily life stress is everywhere and definitely unavoidable. So it is required to differentiate between positive stress and negative stress. Negative stress causes many physical and psychological problems. There are four main category of stress namely eustress, distress, hyper stress and hypo stress.

Positive Stress

Stress is said to be positive when the circumstance offers an opportunity for one to gain something. Eustress implies useful stress-either mental, physical or biochemical, radiological. Eustress is frequently seen as an inspiration since in its nonappearance the individual. Positive stress gives the sprit to accomplish and actuates us to succeed are achieve the following dimension of vocation openings and to get more money related advantages, these positive stress helps women.

Negative Stress

Stress influences individual physiologically and typically and it is connected to a few medical issues, the procedure of physiological stress reaction begins from the minute the body understands the stressor, viewed by the sending of signs to the cerebrum, and to the particular thoughtful and hormonal reactions to take out, decrease or adapt to the stress Sympathetic Response things to go immediately with stress and the synapse is discharged by the nerve endings and is sent to the SNS Enhance the quality of your skeletal muscles.

Nature of stress

The main cause of stress among the work force has become part of human life, due to development, whether it is supposed as a negative or positive experience. There various reasons for stress in workplace conditions are associated with the work pressure, physical and mental-illness. Some of stresses are identified as Job related stress and they are workload, organizational and physical work environment, long working hours, culture and politics of the organization, the restrictions compulsory on behavior, etc. Relationship related stress which is identified outside the workplace. Change in living conditions also plays important role in creating stress (Schneiderman et al, 2016)[3]. Stress linked with the home and workplace interface and it includes conflicts of allegiance, life style and life crisis.

REVIEW OF LITERATURE

Sudha Tiwari (2015)[4] stated that the stress originates from two sources, namely organization and the family. The factors recognized for the stress include anxiety about the replacement and insecurity, future of their children and financial inference. The percentages of women being affected by these in two companies are equivalent. The stress can be managed by maintaining balance between the proficient and the individual responsibility.

Thirumaleswari (2013)[5] has conducted a study on job stress among employees of IT industries in Chennai. She has found that employee becomes stressed when they are allotted with unachievable targets and are unable to manage the given situation. The researcher acknowledged few steps for effectively handling stress. The result from the study stated that the employees should to be avoided by providing overload of work; proper rewards should be giving for their excellent performances of the employee.

Janani (2016)[6] stated in her study that the stress refers to a physical function that is mainly caused by some form of emotional or psychological, it could be a mild depression, work-related pressure and even tremendous behavior qualities that can produce severe stress. However, these problems are considered to run in families and workplaces. Working women suffers from stress issues; it may also be at a risk of making tragedy in their family, work and their life.

Rao N (2017)[7] conducted a study on the effect of stress on women health. Results show that working women are facing higher level of stress than that of the non- working women. It has been determined that stress level of working women were higher when compared to non- working women and that there was a significant difference between women's working status and their stress level. Working women had higher level of stress than unemployed women.

Chaudhari et al. (2014)[8] studied that raise in stress levels are found in female health care professionals in the India due to shortage of manpower, lack of infrastructure, extended working hours and inadequate remuneration for their work. Enthusiastic relaxation exercises had decreased not only the stress levels but also increased the quality of their life and most important patient care.

OBJECTIVES

- To study stress management among women employees of IT industries in Chennai.
- To study the effects of stress on women employees.
- To analyze the level of stress and health impact experienced by women employees.
- To provide suggestions for the women employees to overcome stress.

Research Methodology

Details regarding the research design, data collection questionnaire, sampling plan, area of the study and statistical tools used have also been given. Finally, the limitations of the study have also been briefed.

Research Design

The research design is purely and simply the framework or plan for a study that guides the collection and analysis of the data. The research design indicates the methods of research that is the method of gathering information and the method of sampling study is descriptive in nature.

Sampling Plan

The sampling plan is to be decided about the sampling unit, sample size and sampling method.

Sampling Method

For this study, the samples were drawn using random sample method.

Statistical Tools Applied for the present paper

The following tools and techniques have been used for the analysis of the data.

i. One- way ANOVA

ii. Chi-square

iii. SEM (Structural Equation Modeling)

ANALYSIS OF THE DATA

The data collected through questionnaires have been tabulated. By using the above mentioned statistical tools, the data have been analyzed. Interpretations have been drawn based on the analysis. The findings and observations are the result and outcome of the interpretations made during the course of analysis.

ONE WAY ANOVA

H_{01}There is no significant difference between age with respect to perception about Work Performance, Occupational stress, Organizational stress, Behavioral stress and Stress management.

Table 1: One Way ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Work Performance	Between Groups	28.902	4	7.225	.469	.758
	Within Groups	3016.571	196	15.391		
	Total	3045.473	200			
Occupational stress	Between Groups	53.345	4	13.336	1.148	.335
	Within Groups	2277.023	196	11.617		
	Total	2330.368	200			
Organizational stress	Between Groups	34.181	4	8.545	1.222	.303
	Within Groups	1370.416	196	6.992		
	Total	1404.597	200			
Behavioral stress	Between Groups	32.534	4	8.133	.747	.561
	Within Groups	2132.750	196	10.881		
	Total	2165.284	200			
Stress management	Between Groups	56.259	4	14.065	1.503	.203
	Within Groups	1834.637	196	9.360		
	Total	1890.896	200			
Health Impact	Between Groups	99.393	4	24.848	2.024	.093
	Within Groups	2406.696	196	12.279		
	Total	2506.090	200			

**Significant at 0.05% level

Analysis: It can be seen from Table 1.1 that the p-value is significant at 0.05% level for Stress management of women employee in IT companies. Therefore, the null hypothesis is rejected in such cases.

Discussion: There is no significant difference between age with respect to perception about Work Performance, Occupational stress, Organizational stress, Behavioral stress and Stress management

CHI-SQUARE

Association between age and experience

Table 2: Chi-Square

	Value	df	Asymp. Sig. (2-sided)	Statistical Inference
Pearson Chi-Square	796.351a	16	.000	X 2=796.351a Df = 16 P= .000 <0.05 *Significant at 5% level
Likelihood Ratio	610.141	16	.000	
Linear-by-Linear Association	199.315	1	.000	
N of Valid Cases	201			

*Significant at 5% level

Analysis

Since the P value is lesser than our chosen Significance at =0.05, we can reject the null hypothesis, and conclude that there is an association age and experience.

Discussion:

There is no significant association between age and experience in relation to the variables such as Work Performance, Occupational stress, Organizational stress, Behavioral stress and Stress management.

Structural Equation Modeling

Observed, endogenous variables

Work Performance

Stress management

Observed, exogenous variables

Occupational stress

Health impact

Organizational stress

Behavioral stress

Unobserved, exogenous variables

e2

e1

Variable counts (Group number 1)

Number of variables in your model: 8

Number of observed variables: 6

Number of unobserved variables: 2

Number of exogenous variables: 6

Number of endogenous variables: 2

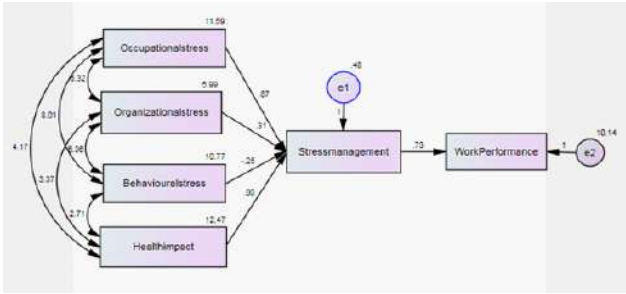

Figure 1: SEM Path Analysis

Model Fit Indices Summary: The important fit indices are presented in the Table below.

Table 3: Major Model Fit Indices Summary

Parameters	Acceptable values for Good Fit	Research Model Values
GFI	>0.9	0.932
AGFI	>0.9	0.900
CFI	>0.9	0.958
RMSEA	<0.06	0.027
RMR	<0.02	0.008

Source: Primary Data, SPSS AMOS output, Haier et al. (2009); Hooper et al. (2008); Steiger (2007); Hu and Bentler (1999).

Interpretation:

The Goodness of Fit Index (GFI) value was 0.932, Adjusted Goodness of Fit Index (AGFI) value was 0.900 and Comparative Fit Index (CFI) value was 0.958. All these values are (greater than 0.9) indicating a very good fit. It was found that Root Mean Score Error of Approximation (RMSEA) value was 0.027 (lesser than 0.06) and Root Mean Square Residual (RMR) value was 0.008 (lesser than 0.02).

Findings

- The respondents are only women employees from IT companies in Chennai city
- The majority of the respondents are employed and below the age of 30
- The result is showing that the stress management and health impact playing a significant role in work performance of working women.
- It is observed from the study that the women employee of IT perceive high level of stress

Suggestions

- Though the stress is common for everyone, the solution for managing stress should be done. Hence, it is suggested that expert can be appointed to identify the problems faced by the women employees working in the IT companies which could help in managing such stress.
- Proper practice relaxation techniques like meditation and yoga should be implemented and awareness should to be created in every IT companies to reduce the level of stress
- It is further suggested that promotions based time bound also be introduced and which will help the employees to get promotion occasionally.
- The stress can be managed by keeping a fine balance between work life and family life. It is advisable to avoid unnecessary concern about the work-place anxiety there itself before coming home.

CONCLUSION

Women working in the IT sectors feel stress due to various professional and family factors, prominent of which being relocation and uncertainty, anxiety about the future of their children and financial implications. Job-related stress is a major issue for working women. Women are being the mainly affected by stress therefore their stress management is essential for both family and work life. Companies have to understand the needs of the women employees and they have to provide relaxation techniques and counseling sessions and to provide good opportunities for their career development. The development of an independent woman's health program that takes a life-course approach to improving their access to healthcare is needed to enable management of all issues that affect women's health. This requires behavioral change communication in the health system to primary-level health workers and through them to the communities. Any people with stress cannot precede their work life balance properly. The human life and stress common and nobody are free from stress. It is not that only people with higher position will have only stressed even the low position people also has stress. If our attitude is positive and its outcome will be also positive. It is also found that in case of IT companies the level of stress is high.

Ethical Clearance: This research was approved by Head of the Department of Management Studies, Sathyabama Institute of Science and Technology, Chennai. The research was reviewed and discussed under the guidance of Research Supervisor of Department of Management Studies, Jeppiaar Engineering College, and Chennai.

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Conflict of Interest: There is no potential conflict of interest reported in light of the current research.

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Superbrain Yoga Enhances Well-Being among School Students

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Abstract

Background: Superbrain Yoga (SBY) boosts pranic energy in the brain. It is based on ear acupuncture and the movement of subtle energy in the body.

Aim: The aim of this study is to improve the well-being of school students by practicing SBY.

Setting and Design: The study involves 1,945 school students from Mysore district, India. SBY was practiced by the students for a period of three months thought by their teachers.

Method: Responses with a questionnaire from the students and their teacher were collected and examined. The questionnaire was on health, relationship with their family and friends, time consciousness, communication skills and activeness of students.

Statistical Analysis: The data collected were analyzed with Chi-square test and contingency coefficient analysis.

Results: Responses of the students were analyzed and they reported that their health has often improved by 78%, sometimes improved (16.3%) and rarely improved (5.6%). Similarly, responses in the relationship with family and friends were found to be drastically improved (81.3%), moderately improved (14.6%) and hardly improved (4.1%). Both the results were found to be significant (p<0.001). Teachers also reported that students improved in their time consciousness, communication skills, and activeness.

Conclusion: SBY has improved the overall well-being of school students.

Keywords: *Brain, family, health, prana, school, yoga*

Introduction

The human brain being more powerful and sophisticated, it becomes essential to maximise its potential for better work output and holistic wellbeing. Many techniques to optimize brain wellness are described in literature. Among them Yoga is most popular. Yoga changes the physiology of the body through breathing techniques, physical postures (asanas), and cognitive control (relaxation and meditation).[1,2] Superbrain Yoga (SBY) is a yogic exercise that cleanses and energies the chakras needed for the brain to function efficiently. The chakras are actually the main acupuncture points. SBY is done by squeezing earlobes with forefinger and thumb in a specific position followed by fourteen squats with controlled breathing technique. By doing this, the ear produces the necessary energy or *prana* connection to the right and the left brain. This causes the left and right brain to become activated and energized.[3]

Crown chakra is located at the crown of the head and has the task of controlling and energizing the brain. The sex chakra is located in the coccyx area. It controls the energy of the gonads and gives them energy. Basic chakra is a dynamic activity center. This is the center of action and operation. If basic chakra is imbalanced, it

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will be very overactive and could lead to several health complications for humans. By doing SBY energy is transferred from the lower centers to the upper centers mainly the crown centre, which control the pineal gland and overall brain health. Hence, SBY could enhance the Pranic energy in the brain. This technique was practiced and developed long ago by Indian rishis to increase the intelligence of people.[4] Earlier studies showed when school childrens practiced SBY it could help in enhancing concentration, confidence,[5] memory, selective attention,[6] academic performance and visuospatial ability [7]. When SBY is practiced for one minute, Alfa wave activity in the brain is increased.[8] It also helps children with Attention Deficit Hyperactivity Disorder (ADHD).[9] SBY is easy to learn technique, cheap and could be practiced daily by school students to improve their overall performance. The present study aims to find the effectiveness of SBY on well-being of school students.

Method

Sample

Thirty eight teachers from many schools in Mysore district, India randomly participated in this study. They were trained about SBY technique. Among them 997 were girls and 948 were boys totalling to 1,945 in number, with their average age of 12.5 yrs. The subjects (teachers and students) were informed about the purpose and method of the study and their consent was obtained. They were guaranteed that they could withdraw from the study at any time.

Study Design

Cross sectional study design was used.

Phases of the study

The study was performed in three phases.

Ist phase

A workshop was performed for the selected school teachers about SBY as hypothesised by Master Choa Kok Sui. They were provided with SBY trainers manual, which contained detailed information about SBY and its procedure

IInd phase

These teachers in turn trained their students who participated in this study about SBY and was practiced for a period of three months. Daily before the school began, teachers guided students to practice SBY except on Sundays and hoildays.

IIIrd phase

Teachers and students responses were collected with a questionnaire and analysed after completion of second phase.

Superbrain Yoga procedure

Stand facing the east, Connect the tongue to the roof of your mouth i.e..palate; Press the right earlobe by the thumb and index finger of the left hand and left earlobe by the thumb and index finger of the right hand; The right hand should overlap the left hand; While sitting, simultaneously inhale and while standing, simultaneously exhale; Repeat the last step for 14 times. [3]

Tools employed for the study

Two questionnaires were used as tools in the present study.

- *Superbrain Yoga Questionnaire for school teachers.*
- *Superbrain Yoga Questionnaire for students*.

Permission

Permission to conduct this study was obtained from Deputy Director of Public Instructions office (DDPI) and from District AYUSH Officer, to conduct the study.

Statistical methods applied

The data collected have been analyzed under Chi-Square test and Contingency Coefficient analysis and the results obtained have been tabulated and interpreted.

Results and Discussion

Improvement in overall health

Table I denoted that 78 % of the students have opined that they have often felt an improvement in their overall health after the practice of SBY. Only 16.3 % of them felt that sometimes they observed improvement and 5.6 % felt that practicing SBY has helped them rarely in improving their health. Chi-square test revealed a significant difference in student's health after SBY (X^2 = 1783.528, P < .001). Among 78 % of the students who

have experienced significant improvement in their health 93.8 % of them are studying in the lower grade (1st to 5th standard), 71 % in the middle grade (6th to 8th standard) and only 66.3 % in the higher grades (9- 10th standard) and the results were found to be signifncant (P<0.001).

Relationship with friends and family members

Both urban and rural area students have found to have experienced improvement in relation to their family and friends. Practice of SBY has helped the students from urban areas to improve the relationship with their friends and family members by 85.1 % than the rural students (78.1 %) and the resuts were significant (P<0.001). The effect of SBY is the same for both boys and girls of all age group (Table II). Chi-square test revealed a significant difference in student's relationship after SBY practice (X^2 = 2049.247, P < .001).

Teachers feedback

To study the impact of SBY on students, 14 teachers were randomly selected and given a questionnaire. There were 11 male and 3 female teachers within age 30 to 55 yrs. Data from teachers were elicited questioned through a questionnaire regarding the effects of SBY on student's time consciousness, discipline, communication skills, memory and activeness of students. It is very encouraging to know that 92.9 % of the teachers opined that they have observed improvement in the time consciousness among students after the practice of SBY and it was found to be significant. As shown in Table III, a majority of the teacher's (85.7 %) of them observed a better discipline in students after the practice of SBY. Majority of the teachers (71.4 %) have opined that they have noticed signs of memory enhancement of the students after the practice of SBY.

Table 1. Frequency and percentage of students who have experienced improvement in overall health related to gender, class and locality and results of test statistics

Responses		Gender		Class			Locality		Total
		Boys	Girls	1-5	6-8	9- 10	Urban	Rural	
Rarely	f	49	60	12	48	49	48	61	109
	%	5.2	6.0	1.7	7.0	8.8	5.3	5.8	5.6
Sometimes	f	137	181	32	148	138	157	161	318
	%	14.5	18.2	4.5	21.6	24.9	17.4	15.4	16.3
Often	f	761	756	662	488	368	695	823	1518
	%	80.4	75.8	93.8	71.3	66.3	77.2	78.8	78.0
Total	f	947	997	706	684	555	900	1045	1945
	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Test Statistics		CC = .055 P = .051		CC =.279 P < .001			CC =.029, P = .451		X2=1783.528 P < .001

Table 2. Frequency and percentage of improvement of student's relationship with friends and family members related to gender, class and locality and results of test statistics

Responses		**Gender**		**Class**			**Locality**		**Total**
		Boys	**Girls**	**1-5**	**6-8**	**9- 10**	**Urban**	**Rural**	
Hardly improved	f	41	38	8	39	32	27	52	79
	%	4.3	3.8	1.1	5.7	5.8	3.0	5.0	4.1
Moderately improved	f	126	158	19	123	142	107	177	284
	%	13.3	15.8	2.7	18.0	25.6	11.9	16.9	14.6
Drastically improved	f	780	801	679	522	381	766	816	1581
	%	82.4	80.3	96.2	76.3	68.6	85.1	78.1	81.3
Total	f	947	997	706	684	555	900	1045	1944
	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Test Statistics	CC =.037 P = .257			CC =.288 P < .001			CC =.090 P < .001		X2=2049.274 p < .001

Table 3. Frequency and percentage of teacher's feedback about students behaviour after regular practice of SBY for 3 months and results of test statistics

Teachers Opinion		**Rarely**	**Sometimes**	**Most of the times**	**Statistics**
More time conscious	f	0	1	13	X2= 10.286 p<.001
	%	0	7.1	92.9	
Discipline of students	f	0	2	12	X2= 7.143 p= .008
	%	0	14.3	85.7	
Communication skills of students	f	0	1	13	X2= 10.286 p<.001
	%	0	7.1	92.9	
Memory enhancement	f	0	4	10	X2= 2.571 p= .109
	%	0	28.6	71.4	
Activeness of students	f	0	1	13	X2= 10.286 p<.001
	%	0	7.1	92.9	

Discussion

The relationship of students with their family and friends have improved along with the physical health indicating overall improvement among students after the practice of SBY. SBY being practiced on a regular basis becomes a physical activity contributing towards the brain wellness of the child. Examinations of SBY practitioners with EEG and Brain Maps show that their brain are fully synchronized and balanced. Even the Alpha waves activity is increased over Frontal, Parietal and Occipital regions of the brain.[8] Elevations in alpha wave activity have been associated with an increased perception of calmness, memory enhancement and pain reduction. Aplha waves are also known to strengethen the immune system, which makes the person healthy.[10] Yoga claims to relax the sympathetic nervous system by activating parasympathetic–limbic pathways that relax body and mind.[11] This helps to enhance children's performance at school. According to studies of Wheeler & Wilkin, [12] yoga improves focus, concentration and learning readiness as well as enhances health and fitness. A positive correlation with yoga in improving physiological and pychological performance of healthy subjects was studied by Mariappan and Subramanium. [13] By performing Yoga, children reported that they felt calmer, could sleep better, less panicky and more relaxed.[14] Child self-esteem showed significant improvements in children's confidence, social abilities and involvement. Child–parent relationship quality also improved.[15]

Earlier studies on SBY revealed that it is a very simple exercise, being performed in less than two minutes can transform and help the students to remain active mentally and intellectually.[16] SBY can play an efficient role in the enhancement of mental activity among college-going adolescence.[17] It exercises the brain and balances energy in the left and right hemisphere of the brain. This balance of energy in the brain contributes to the enhancement of well-being of a person. SBY is an technique that needs no special technology and equipment, no particular time and place to practice as a result, the independence of the practicioner is preserved.

Conclusion

SBY helps in increasing their health and enhanced relationship with family and friends of students. Schools can implement SBY regularly to students to improve their well-beign.

Conflict of Interests: All the authors reports no conflict of interests

Funding: World Pranic Healing Foundation, India funded the study.

Ethical Clearance: Permission to conduct this study was obtained from Deputy Director of Public Instructions office (DDPI) and from District AYUSH Officer, to conduct the study.

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Impact of Kinship on the Chosen Autosomal Anomalies in Sivagangai, Tamil Nadu, India

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Abstract

Significance of study: Prevalence of consanguinity and their impact on the autosomal recessive anomalies such as diabetes mellitus, hearing impairments, epilepsy, limb defect and eye defect among Sivagangai population was studied. The present investigation provides a new plat form for pinpointing out the genetic causes leading to congenital autosomal recessive disorder, so that in future newer gene therapy approaches can be developed to treat such anomalies. In our study, an attempt has been made to evaluate the association of the most common causes of autosomal recessive impairment among heterogeneous Sivagangai population.

Objective: To determine the effect of endogamy on the hereditary anomalies of Sivagangai population.

Study design: Human health survey.

Method: The impacts of kinship against autosomal recessive disorder among the selected population of Sivagangai were studied. In this study, 2376 families were taken for assessment by face-to-face interviewed in the local language according to the standard procedures.

Result: Consanguineous marriage was significantly higher in current generations (29.62%) than the previous generations (37.94%). The occurrences of abnormality were higher among inter breeding populations (67.34%) than non consanguineous population (32.65%). The highest Odd ratio was recorded in epilepsy, followed by hearing impairment, limb defect and eye defects, while, the lowest value was observed in diabetic population. The highest P value, odd ratio and 95% Class Interval recorded were 0.001, 26.48 and 18.63-37.63 respectively. The highest degree of consanguinity reported in the study was 2nd degree in epilepsy.

Conclusion: The present study showed that the hereditary anomalies were higher among cognate population than out breeding population. The children of such con sanguineous couples have higher risk of expressing recessive gene disorders.

Keyword*: Endogamy, Lethality, **e**pilepsy, hearing impairment, limb defect, diabetics and eye defect.*

Introduction

Kinship refers to the culturally defined relationships between two people who share a common ancestor or blood. Consanguineous marriages have been practiced for hundreds of years in many communities throughout the world[1]. Historically, the prevalence of consanguineous marriages is very high in south India. However, marriages between biological relatives are quiet common not only in developed countries but also in developing countries. More than one billion peoples around world are consanguineous [2 and 3]. In India, cognate marriage is a customary practice in some communities. They won't prefer non-consanguineous marriage because of their cultural differences between families. This is based on either matrilineal or patrilineal. The

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endogamous population increases the level of autosomal recessive homozygosity, which leads to biological unfitness of population. This phenomenon is known as inbreeding depression[4]. The children of consanguineous unions have the highest chance for expression of single-gene disorders inherited from their recessive parents. The risk of autosonal anomalies increases with degree of genetic relationship between the parents. In the present study, an attempt has been made to assess the prevalence of consanguinity and their impact on the autosomal recessive anomalies such as diabetes mellitus, hearing impairments, epilepsy, limb defect and eye defect among Sivagangai population. The present investigation provides a new plat form for pinpointing out the genetic causes leading to congenital autosomal recessive disorder, so that in future newer gene therapy approaches can be developed to treat such anomalies.

Autosomal recessive defect selected for the present study

Diabetes mellitus

It is a type of heterogenous metabolic disorder causes high blood sugar level for a prolong period of life. Hence it is called as hyperglycemia. It is due to either the disinfection of beta cells of pancreases to secrete insulin or irresponsiveness of body cells to insulin hormone. Based on this, diabetes can be classified into Type 1 and Type 2 diabetes.Type1 diabets is caused by insufficient production of insulin by pancreas and also called as Insulin dependent diabetes mellitus (IDDM) or juvenile diabetes. Type 2 is caused by insulin resistance power of the cells in our body and also known as non-insulin dependent diabetes mellitus (NIDDM) or adult onset diabetes. Any defective 3 genes for type I and 20 genes for II diabetes are responsible for these anomalies. These genes are localized in 2,3,4,5,6,7,8,10,11,12,13,15,17,19, and 20th chromosomes[5].

Epilepsy

It is a clinically heterogeneous neurological disorder, commonly called as seizures. Seizures are caused by a disturbance in the electrical activity of the brain. Thus the nerve cell produce excessive and abnormal activity at the cortex region of the brain. Epilepsy may occur as a result of genetic disorder and acquired brain injury such as a trauma or stroke. During a seizure, a person experiences abnormal behaviour, symptoms and sensations leads to the loss of consciousness. There are various types of seizures, but all are not involve in convulsion, unconsciousness and shaking. Some of them are caused by single gene defect and many of them were caused by multiple gene defect. Epilepsy is usually treated by medication and in some cases by surgery, devices or dietary changes.

Limb Defect

Congenital Limb defect is the most common complex disorders among human population. This disorder occurs during the specification of upper or lower limb development. This defect is a common congenital disorder next to cardiac anomalies. The impact of congenital limb malformations are reduction of limb size, direction of bone angle, polydactyly and syndactyly. These are genetic syndromes produced by number of point mutations during cell fate determination and regulation during embryogenesis.

Eye Defect

The development of eye is specified through a complex program during the embryonic development. Any anomalies in this specification of eye cause profound defects in the eye. The most common congenital inborn errors in eyes are **anophthalmia, microphthalmia, coloboma, aniridia** and **optic nerve hypoplasia.** The other minor defects are myopia, hypermetropia, presbyopia, astigmatism and cataract.

Ear defect

The ear defect is a problem in recognizing different types of sound from the birth. It is a hereditary disorder due to the loss of certain factors in the uterus during development. More than 50% of the ear defect is caused by genetic factors. The hearing loss is an autosomal dominant or autosomal recessive or X-linked pattern of inheritance. Approximately, about 5% of the population has some sort of such ear malformation. The frequently encountered congenital ear problems are protruding ear and external ear microtia.

The characteristics of nonsyndromic hearing loss vary among the different types.Hearing loss can affect one ear (unilateral) or both ears (bilateral). Degrees of hearing loss range from mild (difficulty understanding soft speech) to profound (inability to hear even very loud noises). The term "deafness" is often used to describe severeto-profound hearing loss. Hearing loss can be stable, or it may be progressive, becoming more severe as a person gets older. Particular types of nonsyndromic

hearing loss show distinctive patterns of hearing loss. For example, the loss may be more pronounced at high, middle, or low tones. Most forms of nonsyndromic hearing loss are described as sensorineural, which means they are associated with a permanent loss of hearing caused by damage to structures in the inner ear. The inner ear processes sound and sends the information to the brain in the form of electrical nerve impulses. Less commonly, nonsyndromic hearing loss is described as conductive, meaning it results from changes in the middle ear. The middle ear contains three tiny bones that help transfer sound from the eardrum to the inner ear. Some forms of nonsyndromic hearing loss, particularly a type called DFNX2, involve changes in both the inner ear and the middle ear. This combination is called mixed hearing loss. Depending on the type, nonsyndromic hearing loss can become apparent at any time from infancy to old age. Hearing loss that is present before a child learns to speak is classified as prelingual or congenital. Hearing loss that occurs after the development of speech is classified as postlingual.[5]

Methodology

The present study was a cross sectional based population investigation, carried out in Sivagangai thaluk, which have many native populations. A total number of 2376 families were investigated. These families were selected by simple random sampling. The details about their subjects in terms of history, clinical features, consanguinity, disorder and pregnancy outcomes in the present generation as well as the previous generation by face-to-face interview in the local language according to the standard procedure[6 and 7]. The maximum care was taken to avoid any wrong interpretation by the respondents. Information was collected through personal visit to the selected families. The collected data were then processed to get the prevalence of consanguinity and defects. The types of disorder were then classified.

Odds ratios were calculated based on the influence of endogamy on autosomal recessive anomalies status in the current generation as well as the respondent's children. For the current generation, cases of respondent's offspring of consanguineous union and non-consanguineous union were experimental and control respectively. Chi-square test was used to ascertain the associated between two or more categorical variables. Since the sample size was small (2x2 tables), the Fisher exact test (two-tailed) was applied. Mantel-Haenszel method was used to calculate Relative risk and confidence level at 95% interval. All statistics test were two-sided and $p<0.05$ was considered statistically significant.

Result

The 2376 families were selected for the cross sectional studied. A total of 704 consanguineous (29.62%) and 1672 non consanguineous (70.38%) union in parental generation were observed. The maternal grand parents of 916 were consanguineous and 1460 non - consanguineous and the paternal grand parents were 887 consanguineous and 1489 non-consanguineous (Figure 1). The overall prevalence of consanguinity among parents was 29.62% and grandparental generation was 37.94%. This showed that th econsanguinity was higher among the grandparent generation than the current generation.

Figure 2 depicts various types of abnormalities among the consanguineous and non consanguineous population. The highest number of anomalies were recorded among consanguineous population. The total number of abnormalities among consanguineous population was 67.34%. The maximum number of degree of consanguinity recorded in 2nd degree.

The P value, odd ratio and 95% CI for diabetes mellitus were 0.02, 8.75 and 6.34-12.09 respectively, for hearing impairment were 0.0006, 22.53 and 15.17-33.47, epilepsy were 0.001, 26.48 and 18.63-37.63 respectively. In the case of Limb defects and eye defects, the P value, odd ratio and 95% CI were 0.0108, 18.24 and 10.99-30.26, and 0.319, 14.44 and 9.53-21.87 respectively (Table 1).

Table1: Odd ratio and P value of consanguineous and non-consanguineous population.

	Consanguineous		Non consanguineous		Odd Ratio	95% Confidence Interval	P value
	Affected individuals	%	Affected individuals	%			
Diabetes	96	60	64	40	8.75	6.34-12.09	0.02
Hearing impairment	120	78.94	32	21.06	22.53	15.17-33.47	0.0006
Epilepsy	168	60	112	40	26.48	18.63-37.63	0.001
Limb	64	80	16	20	18.24	10.99-30.26	0.010
Eye	80	71.42	32	28.58	14.44	9.53-21.87	0.319

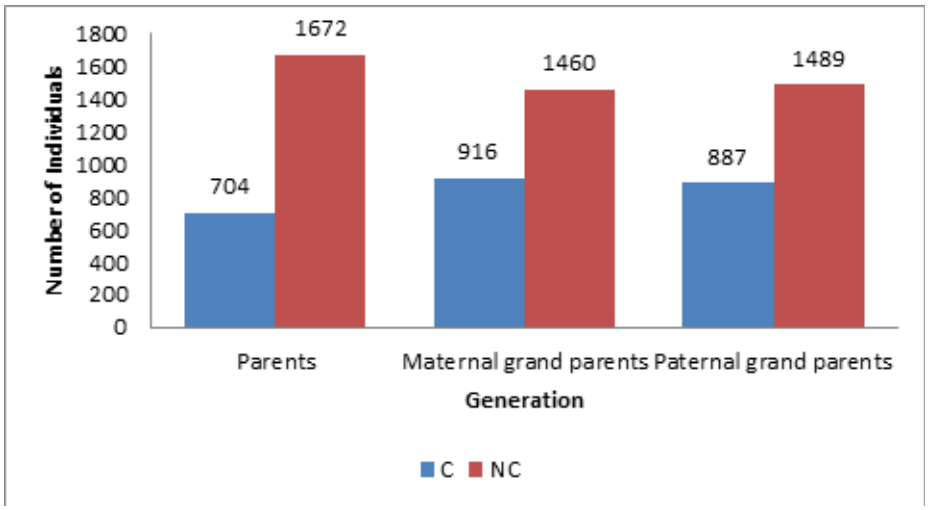

Figure 1: Prevalance of consanguineous and non consanguineous marriages

C: Consanguineous NC: Non Consanguineous

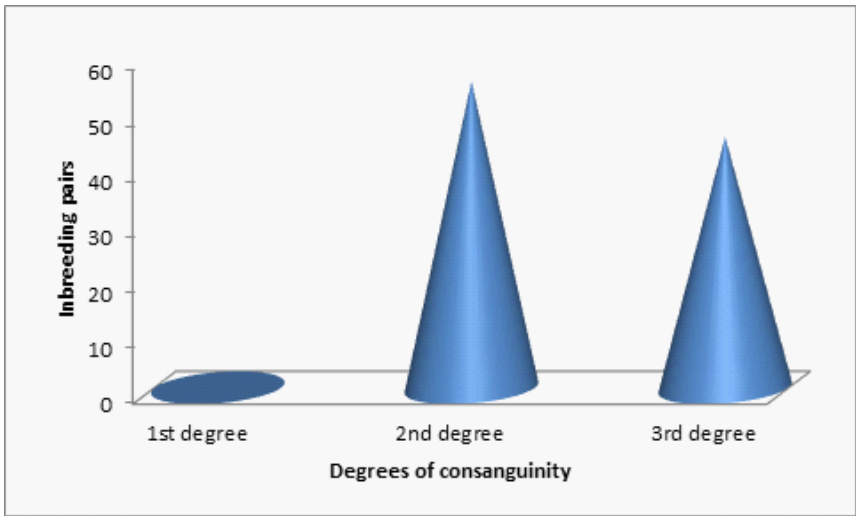

Figure 2: Degrees of endogamy in current generation and parental generation

Discussion

Consanguinity is a couple of biologically blood related individuals of second cousins or more closer to one another[8]. It promotes family stability with significant social and economic advantages[9 and 10]. Kuntla *et al.,* (2013)[11] estimated that the prevalence of consanguineous marriage among Indian population was 38.2%. In this study, consanguineous marriage was higher among grand parents generation (37.94%) than the current generation (29.62%). Among the selected population, 704 couples were consanguineous and 1672 were non-consanguineous of current generation, where as 916 and 1460 of maternal grandparents and 887 and 1489 of paternal grand parents were consanguineous non-consanguineous respectively. The calculated P value was statistically significant. The highest Odd ratio was recorded in epilepsy, followed by hearing impairment, limb defect and eye defects, while, the lowest value was observe eye defectd in diabetic population. The highest degree of consanguinity reported in the study was 2nd degree. The reported marriages were first cousin type. According to the study of Roychoudhury (1976)[12] and Badaruddoza (1998)[13] that the frequency of first cousin marriages in different parts of South India varied from 5 to 57 %. The intra familial marriages have the possibilities of transmitting recessive identical lethal genes from parents to offspring. Such lethal genes cause number of anomalies in children. Congenital malformations are the major reasons for prenatal mortality during gestation in developing countries like India [14 and 15]. In the present study, the prevalence of abnormalities were higher in consanguineous population (64.5%) than the non consanguineous population (34.5%). The studies of Verma *et al.* (1992)[16] and Becker *et al* (2015)[17] had recorded the significant number of congenital malformations among the children of consanguineous couples than the non-consanguineous one. The babies born with congenital anomalies were found to be 3.4 times more from consanguineous parents than non-consanguineous. In the present investigation, the risk of deleterious anomalies was found to be statistically significant.

Diabetics are a most common defect in India. It may be heritable. It may be due to insufficient secretion of insulin by pancreas. Epilepsy is also called as seizure. It is due to any disturbance in the electrical activity of brain. The limb defect is a type of autosomal dominant or autosomal recessive or x-linked anomalies. These genetic defects are caused by primary intrauterine inhibition or intrauterine destruction of normal embryonic tissues. It can also occur with various syndromes in offspring. Teratogenic agents (eg, thalidomide, vitamin A) are known causes of hypoplastic or absent limbs. The other congenital limb anomaly is amniotic band-related limb deficiency, which loose strands of amnion entangle or fuse with fetal tissue. Hereditary hearing loss is an autosomal recessive or X-linked recessive as well as by mitochondrial inheritance. The defective genes cause syndromic or non-syndromic with dominant or recessive genes hereditary hearing loss. The syndromic hearing loss is a hearing impairment associated with specific traits. The dominant deafness is caused by only one faulty gene from the mother or father with hearing impairment. The recessive deafness is because of faulty gene from both the mother and father. There are more than 200 forms of such syndromic hereditary hearing impairment. The human eye is programmed by a complex system of specification during embryonic development. The common congenital eye malformations are anophthalmia, microphthalmia, coloboma, aniridia, and optic nerve hypoplasia. The eye is completely developed in the first trimester of pregnancy. Many genes have been found to have a role in this complicated process. Any alternation in these genes due to point mutations can cause abnormal development in eyes.

Considering the above, the practice of consanguinity should be avoided by educating the public about the adverse effect of blood related marriages. The present investigation provides a new plat form for providing proper health care to public regarding the transmission of lethal endogamic disorders.

Author statement section

Ethical approval – Ethical approval is not required for this study, because we had not used any experimental samples (Blood/ saliva) from the individuals. Before sampling, consent certificate had been received from each individual. We collected data by individual face to face interview.

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Competing Interest- None declared

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Preliminary Phytochemical Screening and FTIR analysis of an Indian Medicinal Herb: Paederia Foetida (Prasarini)

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Abstract

Aim: To carry out the preliminary qualitative phytochemical screening of leaf extract of an Indian herb. *P. foetida* and Fourier Transform Infra-red Spectroscopy (FTIR) analysis of the extract containing the highest number of phytochemicals.

Method: The leaf extracts were prepared using, water, methanol, ethyl acetate and acetone. Several *in vitro* phytochemical analyses were carried to check for the presence various secondary metabolites. FTIR analysis of all the 4 extracts were carried out of the for identifying organic secondary metabolites.

Results: Ethyl acetate extract was found to be positive for most of the qualitative phytochemical screening test containing almost all the phytochemicals. The FTIR analysis revealed, that the leaf-extracts of *P. foetida* had phytochemicals of different functional groups such as alkanes, aromatic compounds, aldehydes, saturated fatty acids, alcohols, carboxylic acids, esters, ethers and alkyl halides

Conclusion: The study concluded that, the Indian herb *P. foetida* is rich secondary metabolites and it can be used in the production alternative and complementary drugs, that can be against various human diseases.

Keywords: *Medicinal plants; Paederia foetida; Phytochemical screening; FTIR analysis; Secondary metabolites*

Introduction

Medicinal plants refer to plants having medicinal or therapeutic values. These medicinal plants are a rich resource of biochemicals which can be used in development of natural drugs against several health ailments. They are also a rich source of nutrition, hence can be used as preventive too.[1] Plants their by-products are also used in various daily use products such toothpaste and oils. The use of complementary alternative medicine has become quite popular across various societies of the world.[2] However, the modern health care system is still heavily dependent on chemical based drugs, which has mild to severe side effects and some of them are slowly becoming ineffective, e.g. antibiotics. Hence, medicinal plants are the best alternative to solve the worldwide problems arising due to synthetic drugs.[3]

Treatment with medicinal plants is an ancient process, as old as human origin itself. The relationship between mankind and their search for drugs is recorded and documented in all civilization, across the world. [4] Knowledge of medicinal plants and their usage is an outcome of years of research and trials by various ancient health care workers to modern day doctors and researchers. Modern day science has also approved and accepted plant based drugs.[5] The knowledge of the development of ideas related to the usage of medicinal plants with awareness has increased the ability of pharmacists and physicians to respond to the challenges that have emerged with the spreading of professional services in facilitation of man's life.[6]

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Paederia foetida is an Indian edible herb that has traditionally been used against gastrointestinal and male infertility problems. *P. foetida* is a promising antioxidant, anti-inflammatory antimicrobial, anthelmintic and anticancer agent.[7, 8] Its efficacy encourages the need of proper scientific evaluation so that it can be considered for development of new drugs. Some studies also validate in erotogenic and aphrodisiac properties.[9] The medicinal properties are majorly due to presence of phytochemicals present in this herb, which acts in combinations or in solitary mode against various human ailments.[7,8] Hence, this study was conducted to know the phytochemicals present in the 4 solvent extracts of the plant and further the best extract is was subjected FTIR analysis for the identification of different functional groups in each extract of *P. foetida* leaves.

Material and Method

Processing of plant material

Fresh young leaves of *P. foetida* plant were collected from the Chandaka forest region, Bhubaneswar, Odisha. The fresh leaves were washed properly, shed-dried and powdered and were stored in airtight polybags for future use.

Extraction

A total of 15-gram sample of powdered leaf samples was taken and extraction was carried out with the help of a Soxhlet apparatus by using different solvent like ethyl acetate, acetone, methanol and water on their polarity basis. After extraction, the extracts were concentrated using a rotary-evaporator. The final crude extracts were stored in a glass air tight container at 4°C until further use.

Primary screening of phytochemicals

Test for Alkaloids

1. **Mayer's test**: To 5 ml of each extract 0.5 ml of Mayer's reagent were added separately and it was observed for precipitation.

2. **Dragendroff's Reagent**: 0.5 ml of Dragendroff's reagent was added separately to each filtrate and observed for orange yellow precipitation.[11]

Test for Carbohydrates

1. **Molisch's Test**: An aliquot of 3 ml of each extract was dissolved in ethanol and two drops of a 20% w/v solution of α-napthol in ethanol were added to it. Further, 1 ml of concentrated H_2SO_4 was added. Appearance of red-purple ring at the interface of the two layers indicated the occurrence of carbohydrates.

2. **Fehling's Test**: An aliquot of 2 ml each solvent extract was dissolved in about 2 ml of distilled water and filtered. An equal amount of Fehling's solution A and B was added to the filtrate and the contents were boiled. Advent of brick red precipitates indicated the presence of reducing sugars.

Test for Cardiac glycosides

1. **Keller killiani's test** (Cardiac glycosides): In a mixture of glacial acetic acid, one drop 5% $FeCl_3$, concentrated H_2SO_4, 2ml of each extract were added. Further at the junction of the 2-layer Reddish brown colour was observed & bluish green colour were observed at the upper layer of the mixture.

2. **Raymond's test**: Few drops of test solution were mixed with hot methanol alkali Further violet colour precipitation was observed.

Test for Anthraquinones

1. **Modified Borntrager' Test**: To 5ml extract, 5 ml 5% $FeCl_3$ & 5ml dilute HCL was added and the mixture was heated for 5min. in boiling water bath. Further it was cooled, and benzene was added to the mixture. Organic layer was separated, Equal volume of dilute Ammonia was added to observe ammonia layer shows pinkish red colour, which indicated the presence of anthraquinones.[11]

Test for Saponin

1. Foam test: Plant extracts were thoroughly mixed with distilled water and stirred well. The formation of foam indicated the presence of saponins.

Test for Coumarins

1. The moistened dry leaf powder in test tube was covered with filter paper pre-soaked in dilute NaOH. The tube was heated in water bath. After some time, filter paper was exposed to Ultraviolet light. The formation light yellowish-green florescence was observed, which indicated the presences of coumarins

Test for Proteins

1. **Biuret test**: To 3 ml leaf extract, 1 ml of 4%

NaOH and few drops of 1% $CuSO_4$ solution was added. Further the formation of violet or pink colour indicated the presence of proteins.

2. **Million's test:** To 3ml leaf extract, 5 ml of millions reagent was added, and it was heated in boiling water bath, Appearance of brick red and pink colours indicated the presence of proteins.

3. **Xanthoprotein test**: To 3ml of leaf extract, 1 ml conc.H_2SO_4 was added. white precipitation indicated the presence of proteins.

Test for Amino acids

1. **Ninhydrin test:** To 3 ml test solution 3 drops 5% ninhydrin solution was added and the mixture was heated in a boiling water bath for 10 min to observe the Purple or bluish colour change, which indicated the presence of amino acids.

Test for Steroids

1. **Salkwoski reaction**: To 2ml of extract, 2ml of chloroform and 2 ml con. HCL was added. Appearance of red colour in the chloroform layer and greenish yellow fluorescence colour in acid layers indicated the presence of steroids.

Test for Flavonoids

1. **Addition of lead acetate:** Small quantity of extract was added to the lead acetate; yellow colour precipitate indicated the presence of flavonoids.

2. **Addition of Sulphuric acid**: By addition of sulphuric acid (66%-80%) to extract yellow colour was observed, which indicated the presence of flavonoids

3. **Addition of Sodium hydroxide:** Addition of increasing amount of sodium hydroxide to the extract showed colorations and decoloured by adding acid, indicated the presence of flavonoids. [11]

Test for Fat and Oil

1. **Solubility test**: Extracts were mixed with the ether, benzene, and chloroform totally mixing of extract shows the presence of oil in the extracts, stains on filter paper shows the presence of the oil in the extracts.

2. **Addition of $CuSO_4$ and NaOH**: Addition of the CuSO4 and NaOH in extract shows the clear blue coloration.[11]

Total phenolics content

The **t**otal phenolic content was evaluated using Folin–Ciocalteu reagent, a method described by Alhakmani et al in 2013.[12]

Total flavonoid content

An aliquot of 0.5 ml of sample solution was mixed with 0.1 ml of 10% aluminium nitrate, 0.1 ml of 1mol.L^{-1} potassium acetate and 4.3 ml of 80% methanol. The mixture was thoroughly mixed and was incubated at room temperature. The absorbance was measured at 415nm. Quercetin was used as standard compound for the quantification of flavonoids content. Results were expressed in milligram of Quercetin equivalents per gram of dried extract. [13]

FTIR analysis

FTIR technique was used for the identification of different functional groups in each extract of *P. foetida* leaves as described in Sravan et al 2015. The infrared spectroscopy spectrum (IR) was obtained using FTIR Shimadzu Japan [14]

Results

Methanol extract of *P. foetida* leaves was recorded for the presence of a maximum number of polar compounds in the crude drug followed by the aqueous extract (Table 1).

Table 1. Extractive values of P. *foetida* leaves

Solvent Used	Extractive Value (% wt/wt)
Ethyl acetate	5.160 ± 0.32
Acetone	11.133 ± 0.4
Methanol	46.306 ± 0.26
Water	22.00 ± 0.12

Preliminary phytochemical screening of *P. foetida* leaf extracts

In the ethyl acetate extract, carbohydrate, glycosides, alkaloids, tannins & phenolic compounds, flavonoids and amino acids were present as recorded (Table 2). Out of which, carbohydrate is richly present in the extract. Other phytochemicals are present moderately. Steroid content was found very low. Carbohydrates, glycosides, alkaloids, tannins & phenolic compounds, flavonoids,

proteins and amino acids were present in the acetone extract. Among of all these phytochemicals, carbohydrate is abundantly present. Others were moderately present. However, proteins, amino acids and steroids content was low. Lastly methanol and aqueous extract show similar results. High amount of carbohydrates, glycosides, alkaloids, tannins & phenolic compounds, flavonoids presence was recorded. The preliminary phytochemical screening of *P. foetida* leaves concluded that, that there was a high number of polar compounds present in the crude extract.

Determination of total phenolic content

The anti-oxidative effectiveness of this plant has been reported due to presence of phenolic compounds. Acetone extract had the highest phenolic content (789.70mg GAE/gm), followed by methanol, aqueous and ethyl acetate (Table 2, Figure 1)

Table 2. Phenolic content in different solvent extracts

Extracts	Phenolics content (mg GAE/gm)
Ethyl acetate	449.1176
Acetone	789.7059
Methanol	652.647
Aqueous	533.529

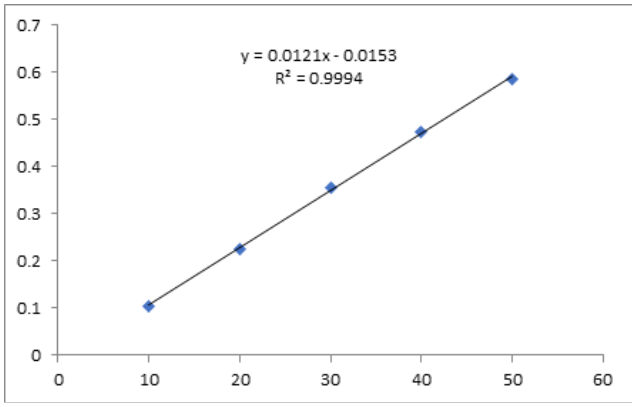

Figure 1. Standard Curve of Gallic acid

Determination of total flavonoid content

Flavonoids are a large group of ubiquitous molecules and possess antioxidant activities. Methanol extract contained highest flavonoid content (44.558 mg QUE/ gm), followed by aqueous, ethyl acetate and acetone (Table 3, Figure 2).

Table 3. Flavonoid content in different solvent extracts

Extracts	flavonoid content (mg QUE/gm)
Ethyl acetate	35.44118
Acetone	25.58824
Methanol	44.55882
Aqueous	43.08824

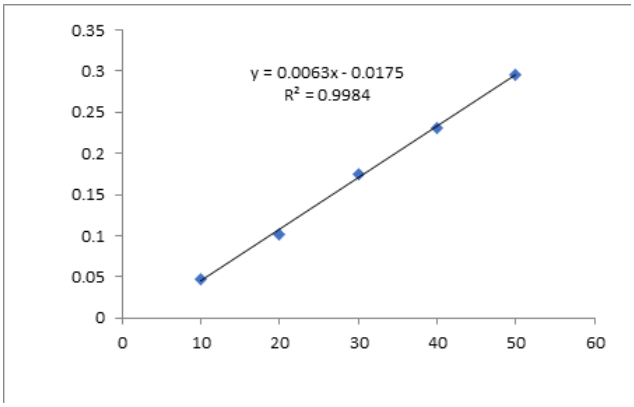

Figure 2. Standard Curve of Quercetin

FTIR Analysis

The FTIR spectral analysis was utilised to identify the functional group of the active ingredients based on peak value in the vicinity of infrared radiation. The results of FTIR peak values and functional groups of aqueous extract are represented in the graph. IR spectrum shows strong absorption peaks at 2850.79cm^{-1}(weak band), 1724.36cm^{-1} (wide), 1600.91cm^{-1} (sharp), 1444.68cm^{-1}(weak), 1049.27cm^{-1}(wide), 831.39cm^{-1}(sharp), which corresponds to the presence of small amount of alkanes (C-H stretch band), aldehydes, saturated aliphatic or α-β-unsaturated esters, aromatics (C-C stretch ring), aromatics, alcohols, carboxylic acids, esters, ethers (wide), alkyl halides respectively. Methanolic extracts showed peak values 2918.29cm^{-1}(sharp), 2850.79cm-1(weak), 1724.36cm-1(sharp), 1600.91cm-1(wide), 819.74cm-1(small) which could be attributed to the existence of functional groups alkane(medium), small amount of alkanes, aldehydes and saturated fatty acids(c=o stretch), aromatics, aromatics respectively. The graph (Figure 3), shows that the peak data of acetone and ethyl-acetate extract are quite same with the methanolic extract. Both,

ethyl acetate and acetone extracts showed peak values 2850.79cm-1(strong band), 1724.36cm-1(strong), 1600.91cm-1(strong), 1444.68(sharp), 1049.27cm-1(small),831.39cm-1(sharp),which corresponds to the presence of alkanes, aldehydes and saturated fatty acids, aromatics, alcohols, carboxylic acids, esters, ethers and alkyl halides, respectively.

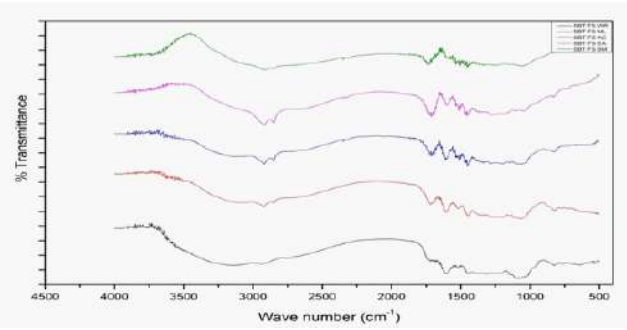

Figure 3: Transmittance of *P. foetida* leaf extracts by [FTIR].

Discussion

As part of the traditional therapy, population of different regions of the world use medicinal plants. Not only whole plant but also some specific parts (such as leaves, bark, etc.) of the plant are used as the herbal therapy.[15] As a part of traditional use, leaves of *P. foetida* is used for the treatment of many human ailments in Indian and other countries. It was confirmed preliminary phytochemical screening that both methanol and ethyl acetate extract of *P. foetida* possess some compounds like alkaloid, tannin, flavonoids, steroids, saponin etc. which may be responsible for amelioration of diarrhoea.[16]

Chemical diversity in natural product is an advantage for human civilization and they are a rich source of new pharmaceuticals, cosmetics, agrochemicals and other economically important chemicals. Therapeutic potentials of plant-based drugs ranges from simple parts of plants, to simple extracts to isolated active constituents.[17] Plants may be considered as biosynthetic laboratories in which various kinds of organic compounds are synthesized such as carbohydrates, proteins, lipids, flavonoids, glycosides, alkaloids, volatile oils, and tannins etc., which exert a physiological effect and are utilized as biologically active components by man since time immemorial.[18,19] The therapeutic value of any plant drug, however, depends on the nature of chemical constituents present in it and is referred to as active principle. Phytochemical screening comprises of different chemical tests and chemical assay. The isolation, purification and identification of active constituents are chemical methods of evaluation. The phytochemical evaluation helps in establishing chemical profile of crude drugs.[19] The purity of crude drugs is ascertained by quantitative estimation of the active chemical constituents present in them. The method may be useful in determining single active constituents or the group of related constituents present in the same drug. [20]

Conclusion

Ethyl acetate extract was found to be positive for most of the qualitative phytochemical screening test containing almost all the phytochemicals. The FTIR analysis revealed, that the extracts of *P. foetida* leaves had phytochemicals of different functional groups such as alkanes, aromatic compounds, aldehydes, saturated fatty acids, alcohols, carboxylic acids, esters, ethers and alkyl halides. The study concluded that, *P. foetida* is rich secondary metabolites and it can be used in the production alternative and complementary drugs.

Conflict of Interest: None.

Funding: None

Ethical Permission: Not required.

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Clinical and Biochemical Profile of Indians with type 2 Diabetes Mellitus: A Study from a Tertiary Care Hospital in Greater Noida

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Abstract

Objective: To study the clinical and biochemical profile of newly detected type 2 diabetes mellitus patients from a tertiary care hospital in Greater Noida,Gautam Buddh Nagar.

Method: At total of 100 newly diagnosed type 2 diabetes mellitus patients presenting in the Department of Medicine were included and studied. A detailed clinical history, examination and investigations were recorded.The presence of microvascular and macrovascular complications of diabetes mellitus was assessed using this clinical and laboratory data.

Results: There were 52 males and 48 females. Maximum patients belonged to fourth decade and upper-lower socioeconomic status.20% patients had obesity and 50% people were overweight. Polyuria was the chief presenting complaint in 51% cases with polydipsia,weight loss and weakness being the other common symptoms. 62 % of the diabetics had hypertension. Increased cholesterol was reported in 44% and 53 %patients had altered triglyceride. The prevalence of neuropathy, retinopathy and nephropathy was 33%, 28% and21 % respectively.

Conclusion: Type 2 diabetes mellitus patients present with comorbidities and complications frequently. Significant proportion of patients in this study had poor glycemic control as well as microvascular complications at the very time of diagnosis.A vast majority were overweight with high waist circumference. Commonest observed comorbidities with diabetes were that of hypertensionand dyslipidemia.

Keywords:*type 2 diabetes mellitus,Neuropathy, Retinopathy, Nephropathy.*

Introduction

Diabetes Mellitus is a chronic, progressive disease characterized by elevated levels of blood glucose. It is a non-communicable disease due to either genetic or acquired deficiency in production of insulin (type 1 diabetes mellitus)or a lack of action of insulin (type 2 diabetes mellitus).Raised blood glucose, a common effect of uncontrolled diabetes, may lead to serious damage to the heart, blood vessels, eyes, kidneys and nerves. Eventually, diabetics are further affected by various diseases including obesity, hypertension, microangiopathy and metabolic syndrome.

Diabetes is the cardinal cause of death globally with an estimated 3.7 million deaths in 2012. This number includes 1.5 million deaths as direct cause, and an additional 2.2 million deaths from cardiovascular diseases, chronic kidney disease, and tuberculosis due to hyperglycemia. After 50 years of age, middle income countries have the highest proportion of deaths attributed to diabetes.The prevalence of diabetes mellitus is on

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rise, particularly in developing countries. It has been predicted that India along with China will harbour more than 75%of global diabetic load by 2025.[1,2]

The starting point of management in diabetes is an early diagnosis – the longer a person suffers with undiagnosed and untreated diabetes, the worse their outcomes are meant to be. The disease may go undiagnosed for several years, until complications have already arisen. To facilitate early diagnosis and suggest lifestyle modifications to curb the onward progression of the disease,it is vital to describe and understand the clinical and biochemical profile of diabetes population. Hence the current research was carried out with an objective to study the socio-demographic and biochemical profile of diabetes patients attending diabetes clinic in a tertiary care hospital in GautambudhNagar,Greater Noida,Uttar Pradesh.

Materials and Method

This retrospective study was carried out in the department of Medicine, Government Institute of Medical Sciences, Gautam budh Nagar. Case records of 100 newly diagnosed type 2 diabetes mellitus patients of both genders were enrolled randomly for the study.

Inclusion criteria

The American Diabetes Association criteria were used for selecting the newly diagnosed type-2 diabetes mellitus patients. i.e. a fasting plasma glucose (FPG) level of >7.0 mmol/L or ≥126 mg/dL after a minimum 12-hour fasting, or two-hour post glucose level (oral glucose tolerance test) of >11.1 mmol/L or ≥200 mg/dL on more than one occasion, with symptoms of diabetes.

Exclusion criteria

The case records of patients having the following features were excluded from this study

1. Type-1 Diabetes mellitus or established diabetes mellitus on treatment for more than 6 months.

2. Patients with pregnancy/ gestational diabetes.

Case records of the patients from diabetic clinic of our hospital having thorough work up and comprehensive case history including details of age, presenting complaints, diet, smoking, alcohol consumption, physical activity, socioeconomic statuswere included. The findings ofgeneral physical examination,history of hypertension and other co-morbid conditions was assessed from case records. Socio-economic status of the study subjects was divided according to Kuppuswamy classification.[4] The American Heart Association criteria was referred to define and diagnose hypertension.[5]

Anthropometric data measured using standardized procedures was recorded from case sheets. Results of clinicaland biochemical tests, such as urinalysis (first-morning sample for micro-albuminuria), complete haemogram, plasma glucose, glycosylated haemoglobin (HbA1c), renal function tests, and lipid levels including total cholesterol (TC), triglycerides (TG), and high-density lipoprotein-cholesterol (HDL) levels and Low-density lipoprotein-cholesterol (LDL-C) were recorded from the case records andanalysed. Dyslipidemia was defined when one of the following was present: Triglyceride (TG) concentration more than 150 mg/dl or Cholesterol concentration more than 200 mg/dl or HDL cholesterol less than 50 mg/dl in females and less than 40 mg/dl in males or LDL more than 100 mg/dl. This classification was conforming to ATP III (Adult Treatment Panel III) guidelines.[6]

The nervous system examination at the time of initial evaluation for touch, pain, vibration and reflexes was recorded from thecase sheets and analysed. 128 Hz tuning fork was used to examine vibration sense and 10 g monofilament for light touch perception in diabetic clinic.

Records of fundus examination for assessment of retinawere interpreted and 24hour urinary albumin estimationdone was used to diagnose nephropathy. Coronary artery disease (CAD) was reported on the basis of electrocardiograph (ECG) changes, treadmill test and echocardiography reports. Patient was reported to be having stroke if supported byclinical history, examination,and non-contrast CT scan. Data of peripheral arterial disease,which was diagnosed by history of claudication, absence of pulses or Doppler study wherever required,was recorded and analysed.

Data Analysis: Data were compiled, tabulated and analysedby using standard appropriate statistical technique, which includes numbers and percentages. The mean and standard deviation was obtained for summarizing the quantitative variables.

Results

In this study, data of 100 patients with newly diagnosed type 2 diabetes mellitus who presented in diabetes clinic of our hospital were studied.Out of these cases, 58 were females and 42 were male.Maximum incident cases wereseen in the fifth decade of life with a mean age of subjects being 54.6 years.The maximum number of patients,around 35% belonged to upper- lower socioeconomic status.The education status showed that majority of subjects in our study,around 68%,were either had no formal education or educated only upto primary level (table 1).

Table 1: **Demographic variables of the Patients**

Gender	Number of patients(%)
Male	42(42)
Female	58(58)
Age (years)	
≤ 35	2(2)
36-50	29(29)
51-65	49(49)
>65	20(20)
Socioeconomic status	
Upper	6(6)
Upper middle	10(10)
Lower middle	25(25)
Upper lower	35(35)
Lower	24(24)
Education level	
No formal education	28(28)
Primary	40(40)
Secondary	27(27)
Tertiary	5(5)

It was observed that BMI was significantly high,with 50% patients being overweight and 20% obese.70% patients had high waist circumference (table 2)

Table 2: BMI and Waist circumferenceof the study subjects

Variables Number of patients(%)
BMI ≤ 18.5 (Underweight) 2(2) 18.5 - 22.9 (Normal) 28 (28) 23 - 24.9 (Overweight) 50 (50) ≥ 25 (Obese) 20(20)
Waist circumference Female(58) >80 cm 50(82.7) Male (42) >90 cm 20(47.6)

Table 3:Biochemical profile of study subjects

Variables	Number of patients(%)
Glycaemic status (HbA1c%) <7 (good control) 7-8 (sub-optimal control) 8-9 (sub-optimal control) >9 (uncontrolled)	 3(3) 19(19) 34(34) 44(44)
Microalbuminuria	21(21)
Hypercholesterolemia (>200mg/dl)	44(44)
Hypertriglyceridemia (>150mg/dl)	53(53)
High density lipoprotein cholesterol(<35mg/dl)	39(39)
Low density lipoprotein cholesterol(>130mg/dl)	33(33)
Normal Blood pressure	38(38)
High blood pressure	62(62)

44%of the patients had uncontrolled diabetes with a high glycated haemoglobin greater than 9%. In our study 44 patients had increased cholesterol and 53 patients had hypertriglyceridemia. 62% were hypertensive and 38 %were normotensive among diabetics (table 3).

Mostcommon presenting symptom in our study was polyuria(51%),with polydipsia(32%),weight loss (35%) and weakness (38%)being other common ones.Among

microvascular complications,neuropathy,retinopathy and nephropathy was reported in 33%,21% and 28% of our subjects respectively. The prevalence of coronary artery disease,peripheral vascular disease and stroke was found to be 13%,6% and 3% respectively(table 4).

Table 4:**Presenting symptoms and complications**.

Presenting symptoms	Number of patients(%)
Polyuria	51(51)
polydipsia	32(32)
polyphagia	18(18)
Weight loss	35(35)
Paresthesias	16(16)
Weakness	38(38)
Blurred vision	15(15)
Skin manifestation	8(8)
Urinary tract infection	16(16)
Altered sleep	10(10)
Microvascular complications	
Neuropathy	33(33)
Nephropathy	21(21)
Retinopathy	28(28)
Macrovascular complications	
Coronary heart disease	13(13)
Peripheral artery disease	6(6)
Stroke	3(3)

Discussion

The prevalence of diabetes mellitus is on a rise,particularly in developing world.In near future,India shall become the diabetes capital of the world. Our main concern through this study was to assess the profile of diabetic patients in this part of Uttar Pradesh so that we can prevent or decrease the burden of complications by early diagnosis and intervention.

In this study maximum incident cases of diabetes mellitus occurred in fifth decade,followed by fourthdecade.The risk of developing diabetes, especially type 2 diabetes mellitus, greatly increases with age, where the most affected age group is that of 40–59 years.[7] This finding is in accordance with other Indian studies which also report the highest incidence in fourth and early fifth decade.[8,9]

Maximum number of patients in our study were from low socio-economic status. This may be due to a greater number of poor people in the vicinity of our institute where study was conducted. The demographic profile of the study participants can be explained by the fact that the hospital where this study was conducted is a government hospital. In a study Mudhaliar MR et al,similar results were reported.[10]

With regard to gender, while our study had 58% females as compared to 42% of males, a study from Gujarat found males to be 62% of the total.[11]

In our study majority of the patients were either educated upto primary or had no formal education while few studies observe a high literacy rate with illiterates forming a mere one percent in their study.[11]

In the present study, the majority (70%) of the subjects were either overweight or obese. This is consistent with the findings of various other studies.[11,12] Ideal normal BMI was observed in only 28% patients which could be because of poor awareness about weight management as a measure to control diabetes. The was similar to a study in Brazil where normal BMI has been reported in 24% patients.[12]

Another noteworthy finding in our study was that diabetic females overpower males in the proportion of being having high BMI with a higher waist circumference seen in almost 50%of females. High mean of BMI in females though being significantly low weight and short statured when compared to the males could be explained from a sedentary lifestyle of females. A high proportion of abnormal waist circumference and a high mean of BMI in the female subjects forecasts higher insulin resistance in them due to decreased insulin sensitivity.[14]

The main presenting symptom in our study was polyuria. Similar presentation of a classic symptom in newly diagnosed diabetics was reported in few other studies.[15]

In the present study, only 3% of the subjects had good glycaemic control while 44% had uncontrolled diabetes. This was similar to a study from Gujarat who reported only 7% of their participants with controlled diabetes whereas 41% with uncontrolled diabetes.[11]

A Swedish study reported that 34% of type 2 diabetes subjects had good glycaemic control.[16] Again a few other studies reported good control of glycemia in more than 30%.[17,18]

Awareness and intervention programs targeting the measures at glycemic control among diabetics are the need of hour. Our study showed around 62% diabetic patients to be hypertensive. Basavegowda M et al from urban slums of city of Mysore also showed the prevalence of hypertension to be around 65% in diabetics.[19] Some showed almost 50%hypertension prevelance in diabetic population.[11]

The lipid profile was significantly deranged in our diabetic study subjects. The most prevalent form of dyslipidemia in this study was Hypertriglyceridemia which was seen in 53% of diabetics. The pattern of dyslipidemia in our study more or less matched the typical diabetic dylipidemia,that is high TG and low HDL as reported in many studies.[22]

Our study reported a high prevalence of microvascular complications with retinopathy (21%), peripheral neuropathy (33%) and nephropathy (28%). This was similar to a study from cenral India which showed a prevalence of retinopathy (26%),peripheral neuropathy (26%) and nephropathy (22%).[9] Another study from south India also reported a high prevalence of retinopathy.[20] The diabetics with retinopathy had poor glycemic control, a significantly high fasting plasma glucose and were mostly dyslipidemic. These findings were in accordance with other studies from India.[9,20] A close prevalence of nephropathy to retinopathy might be used in the prediction of a high-risk of concomitant diabetic neuropathy in patients with retinopathy,though some earlier studies did not show this pattern.

The prevalence of coronary artery disease,peripheral vascular disease and stroke in our study was found to be 13%,6% and 3% respectively. A similar study in South India on new onset type 2 diabetics showed prevalence of coronary artery disease(25%), peripheral vascular disease (11%) and stroke (8%).[23] These results suggest that complications in diabetes mellitus begin before overt hyperglycemia is seen.

Conclusion

Most of the patients were not obese in our study but were overweight and had high waist circumference. Hypertension was the commonest observed comorbidity. Significant percentage of our patients had microvascular complications at the time of diagnosis of diabetes mellitus.Hence blood sugars and lipid profile should be aggressively managed early in the course of disease to prevent life threatening complications. The demographic profile of the diabetic patients attending our hospital comprises mainly of lower socioeconomic class and has poor literacy rate.Therefore, educating the masses with increased awareness about the disease and its management is of prime importance.More population-based studies on a larger scale are required further to increase our understanding and better identification of the magnitude of the problem.

Ethical Clearance- Taken from Ethical committee of Government Institute of Medical Sciences.

Source of Funding- Self

Conflict of Interest - Nil

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Effect of Proprioceptive Neuromuscular Facilitation (PNF) Pattern on Respiratory Parameters in Chronic Bronchitis

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Aim: To study the effect of PNF pattern on respiratory parameters in chronic bronchitis.

Objectives: To find the effect of PNF pattern on respiratory parameters and to compare the effects of pursed lip breathing and PNF pattern in chronic bronchitis.

Materials and Method: 60 patients were included according to inclusion and exclusion criteria by consecutive random sampling and were divided into two groups, group A (Conventional-PLB) and group B (D1 & D2 flexion and extension) - with 30 patients in each group. The treatment was given for 2 weeks thrice a day. After 2 weeks effect of interventions were assessed by taking Respiratory Rate (R.R), Oxygen Saturation ($SpO_{2)}$ and FEV_1/FVC.

Results:. There was significant difference in R.R, SpO_2 and FEV_1/FVC seen with PNF pattern exercises. The intra group comparison showed significant improvement in R.R, SpO_2 and FEV_1/FVC. The inter group comparison showed no significant improvement in SpO_2 and FEV_1/FVC except R.R

Conclusion: PNF pattern has shown significant improvement in SpO_2, R.R and FEV_1/FVC

Key words: *Chronic Bronchitis, PNF, PLB, PFT.*

Introduction

Chronic bronchitis is a term that describes inflammation of the bronchial tubes (i.e. bronchi and smaller branches termed bronchioles) that results in excessive secretions of mucus into the tubes, which leads to tissue swelling that can narrow or close off bronchial tubes.

One of the major disease includes COPD, the significance of which is difficult to overestimate. According to the GOLD (2013), guidelines states that chronic bronchitis is a completely independent disease but one which can precede the development of airflow limitation as well as cause or aggravate the persistent airflow limitation. The primary risk factor for majority of patients is smoking. [1]

Chronic bronchitis is defined as a productive cough that lasts for three months for at least two consecutive years. Most people with chronic bronchitis have chronic obstructive pulmonary disease (COPD). [1,2]

The common characteristic of the disease is obstruction to airflow out of the lungs which leads to poor gas exchange and difficulty in breathing. [2]

Symptoms include dyspnea, cough with mucus (sputum) production, wheezing are generally seen. [15] Other features are: constriction in the chest, tachypnoea, tachycardia, adventitial breath sounds, accessory muscles becomes active, thick and stringy mucus.

The other causes are long term exposure to irritating gases or particulate matter, respiratory infection and most often from cigarette smoke.

The pathological foundation for chronic bronchitis is due to the over production of mucus in response to the inflammatory signals, this is known as mucus metaplasia. The overproduction and hypersecretion is due to the presence of goblet cells and reduced elimination of mucus.

The mechanisms responsible for mucus metaplasia is associated with the function of the T cells, this mechanism is still poorly understood but it is believed to

be linked to end production of the cells called as Th2 cells which are inflammatory cells while the cellular response is thought to be attributed to the Th1 inflammatory cells, cytokine substance is produced by both the cells that have an influence on mucus production associated with chronic bronchitis. [2]

Airflow obstruction is caused due to mucus metaplasia through several mechanisms and they causes luminal occlusion, thickening of the epithelial layer which intrudes on the airway lumen and the mucus alters the airway surface tension. [2]

Due to this, the airway has high tendency for collapse and also decreases the capacity for airflow and exchange of gas. [2]

Mucus hypersecretion is one of the risk which is associated with cigarette smoking, viral infections, bacterial infections or inflammatory cell activation.

When combined with poor ciliary function, distal airway occlusion, ineffective cough, respiratory muscle weakness and reduced peak expiratory flow rate clearing secretions becomes difficult and requires high energy expenditure. [2]

Chronic bronchitis is a condition in which an obstructive ventilation disturbance of the respiratory passages evokes a feeling of shortness of breath. Respiratory rate, oxygen saturation, chest mobility, expiration are all affected. [2]

Furthermore, the amount of air exhaled during initial one second (FEV1) is reduced and is reduced to a greater degree than the entire Forced Vital Capacity and FEV_1/FVC ratio is affected. [10]

PFT is used to measure the lung volumes and capacities which shows decreased FEV_1/FVC ratio . It is an investigation tool for monitoring of patients with respiratory pathology. It also provides information about large and small airways, the pulmonary parenchyma and the size and integrity of the pulmonary capillary bed. [10]

As this is progressive condition and can worsen the quality of life, the physiotherapy plays an important role for promoting good health by reducing breathlessness, improves chest mobility by various breathing exercises.

Breathing exercise and other ventilatory techniques also have a vital role in influencing the rate, depth and distribution of ventilation. [10]

Pursed lip breathing is used as a conventional treatment in chronic bronchitis which showed improvement on respiratory parameters and also in reducing dyspnea. [10]

PNF i.e. D1 and D2 flexion and extension used as an advance technique which has also some improvement.

PNF pattern and methods of treatment were used to obtain the maximum quantity of activity, which can be achieved at each voluntary effort and the maximum possible number of repetition of the activity to facilitate the response.

In the development of PNF techniques, greater emphasis was placed on the application of maximal resistance throughout the range of motion, using many combinations of motion that were related to primitive patterns and the employment of postural and righting reflexes.

In the modern field, the advanced physiotherapy techniques of PNF are being applied as a means of stimulating response and strengthening muscles related to respiration.

PNF mobility exercise aims in improving the pulmonary functions and the mobility of chest wall, trunk and shoulder. [11]

As D1 and D2 flexion extension involves movement of shoulder which improves chest mobility and also shows improvement in chest expansion and mobilizing secretions.

This study is basically done to find the effects of PNF pattern on respiratory parameters and also to compare the effects of PLB and PNF as there are very few literatures available on it. This technique is rarely used in hospital setup so after the study, based on the findings we can prescribe the more effective treatment to the patients for prevention of chronic bronchitis complications and symptoms and thus enhance the patient's recovery which can also improve the quality of life.

Method

Study type: Experimental study

Study design: pre test or post test

Sample size: 60 (30 + 30)

Place of study: Krishna Hospital, Karad

Criterion for Study

Inclusion criteria:

- Both male and female
- Patient diagnosed with chronic bronchitis
- Patients with reduced chest wall movements and reduced air entry
- Haemodynamically stable patients who are willing to participate in the study.

Exclusion criteria

- Any recent thoracic surgeries and abdominal surgeries
- Any musculoskeletal abnormalities limiting the shoulder girdle functions.
- Neuromuscular weakness of upper limb
- Patients with grade IV dyspnea (according to MMRC grading).

Procedure

The subjects who were admitted in wards and those falling in inclusion criteria were selected. Each subject was screened as per inclusion and exclusion criteria and was informed about the study and a written consent was taken from them.

By using consecutive random sampling method the participants were divided into two groups.

Group A and Group B and was named as Conventional and Experimental group. PLB exercise was given as a conventional exercise and PNF was given to the experimental group.

The intervention was given for 2 weeks and thrice a day for both the groups.

Pre test and post test evaluation was taken, which includes: R.R, SpO_2 and FEV_1/FVC

Intervention :

GROUP A : PLB was given in this group. Patient was positioned in semi fowler position with relaxed shoulders and slowed expiration was done by pursing the lips. It was performed 10 times and was given for 2 weeks thrice a day.

GROUP B : In this group, PNF pattern was given: D1 flexion and D1 extension, D2 flexion and D2 extension. It was performed with 10 repetitions for 2 weeks thrice a day. After two weeks of session post test and statistical analysis was done.

Outcome Measure

- SpO_2 / R.R
- PFT: FEV_1/FVC

Results

Table 1: Comparison of pre and post R.R, SpO_2 and FEV_1/FVC within the group

	MEAN ± SD	MEDIAN	P VALUE	t VALUE	df
GROUP A PRE R.R	17.7±3.800	17.000	0.0004	3.096	29
GROUP A POST R.R	19.6±2.527	19.500			
GROUP A PRE SpO2	94.76±2.775	95.000	<0.0001	8.515	29
GROUP A POST SpO2	96.76±2.046	97.000			
GROUP A PRE FEV_1/FVC	75.38±4.457	76.000	<0.0001	13.868	29
GROUP A POST FEV_1/FVC	80.33±4.221	81.000			

Table 2: Comparison of pre and post R.R, SpO_2 and FEV_1/FVC within the group

	MEAN ± SD	MEDIAN	P VALUE	t VALUE	df
GROUP B PRE R.R	16.9±2.528	14.000	<0.0001	14.715	29
GROUP B POST R.R	17.46±2.374	18.000			
GROUP B PRE SpO_2	94.73±2.559	95.000	<0.0001	7.909	29
GROUP B POST SpO_2	96.96±1.86	96.500			
GROUP B PRE FEV_1/FVC	75.63±4.214	78.000	<0.0001	10.912	29
GROUP B POST FEV_1/FVC	81.5±3.288	81.500			

Table 3: Comparison of pre and post R.R, SpO_2 between the group

	GROUP A & GROUP B	MEAN ± SD	MEDIAN	P VALUE	t VALUE	df
R.R	PRE	17.7 ± 3.800	17.000	0.931	4.160	58
	PRE	15.4 ± 2.528	14.000			
R.R	POST	19.6±2.527	19.500	0.0013	3.370	58
	POST	17.46±2.374	18.000			
SpO2	PRE	94.76±2.775	95.000	0.9616	0.0483	58
	PRE	94.73±2.559	95.000			
SpO2	POST	96.76±2.046	97.000	0.693	0.395	58
	POST	96.96±1.866	96.500			

Table 4: Comparison of pre and post FEV_1/FVC between the group

FEV1/FVC	PRE	75±4.457	76.00	0.573	0.565	58
	PRE	75.63±4.214	78.00			
FEV1/FVC	POST	80.33±4.221	81.00	0.237	1.194	58
	POST	81.5±3.288	81.50			

Statistics

The outcomes were assessed at the 1st day prior to treatment and at the end of 2nd week post treatment. Inter group analysis was done by unpaired 't' test and intra group analysis was done by using paired 't' test. The inter and intra group analysis was done by using Instat 3.

Discussion

Chronic Bronchitis is common but a variable phenomenon on COPD with numerous clinical consequences and reduced lung function with increase in airflow obstruction[1]

The therapeutic role of PNF pattern based on stretch-reflex theory in altering pulmonary functions. E.Dean, Donna Frownfelter stated that ventilation has been improved, chest wall muscles are being maximally stretched and ribs are naturally opening up in butterfly technique where the inspiration with trunk extension, shoulder flexion, abduction and external rotation (D2 flexion) and the expiration with trunk flexion, shoulder extension, adduction and internal rotation (D2 extension) . [4]

Vanessa Resqueti stated that pursed lip breathing is used conventionally which has been showed in reducing the dyspnoea and has greater effect on improving pulmonary function. [10]

The main objective of the study was to find the effect of PNF on improving the pulmonary function in chronic bronchitis.

In the present study, the sample size was 60 and they were divided into two groups: group A (conventional group) and group B (experimental group) which consisted of 30 participants in each group. The participants were selected on the basis of inclusion and exclusion criteria.

In this, the efficacy of D1 and D2 flexion and extension pattern on respiratory rate, oxygen saturation and FEV_1/FVC were investigated. They were investigated using Pulmonary Function Test. The intervention was given for 2 weeks thrice a day.

After the intervention statistical analysis was done where; Respiratory Rate, SpO_2 and FEV_1/FVC ratio of pre and post were compared by paired 't' test of within the groups. Whereas, the comparison between the groups were also done by comparing pre and post R.R, SpO_2, FEV_1/FVC of group A with group B by unpaired 't' test.

Post intervention it was found that there was significant improvement within the group A and group B and in comparison of both the groups there was no significant improvement may be because the shoulder movement didn't had effect on improving lung volumes and capacity and thus FEV_1/FVC ratio and oxygen saturation was not improved.

And also, during intervention patient had difficulty in performing shoulder flexion and extension repeatedly due to dyspnoea where some of the participants were performing trick movements.

Therefore, various dyspnoea relieving techniques were given to the patient like pursed lip breathing, forward leaning position and rest which helped in relieving dyspnea.

It was difficult to treat dyspnoea in grade 3 patients, as some patients were non –co-operative and some didn't do exercises independently once the therapist is taught how to do the exercise and instructed to do number of times in a day, which hampered the results of the study

and recovery in the patients.

But there was significant improvement in respiratory rate post intervention may be due to chest wall muscles are being maximally stretched and the inspiration with trunk extension, shoulder flexion, abduction and external rotation (D2 flexion) and the expiration with trunk flexion, shoulder extension, adduction and internal rotation (D2 extension).

As the intercostals muscle and diaphragm contains sensory muscle spindles that respond to elongation. A signal is sent to spinal cord and anterior horn cells. These neurons signal make more muscle fibers to contract (recruitment) and thus increase the strength. Stretching the ribs and diaphragm activate the stretch reflex and help the patients to take a deep breath which helps in improving the quality of breathing and thus improves the respiratory rate.

Few studies like D.Anandhi, P.Deekshitha - PNF shows an immediate improvement in FVC and IC thus shows an enhanced lung function among collegiate students.

Leandro Ferracini - concluded that pursed lip breathing reduces dynamic hyperinflation and improves exercise tolerance, breathing pattern and arterial oxygenation at submaximal intensity exercise.

Gopi Parth Mehta - shows significant improvement in chest expansion and pulmonary function test such as forced expiratory volume and forced vital capacity than only active assisted exercise program for elderly subjects.

After comparing with the above study, PNF exercise has important role on pulmonary function as the therapeutic role of PNF pattern is based on stretch reflex theory in altering pulmonary functions with D1 and D2 extension it showed improvement in oxygen saturation, respiratory rate and FEV_1/FVC ratio.

But in comparison it had no significant improvement except respiratory rate which may be due to short intervention duration and small sample size may be responsible for the baseline differences that appeared to exist in the groups for PLB and PNF.

Conclusion

Based on the statistical presentation, analysis and interpretation it can be concluded that Proprioceptive Neuromuscular Facilitation pattern has shown significant improvement in SpO_2, R.R and FEV_1/FVC.

The present study provided the evidence to support that both the techniques are effective on SpO_2, R.R and FEV_1/FVC individually in chronic bronchitis patients.

However, the techniques when compared with each other were equally effective and there were no significant difference between each other but had shown significant improvement in R.R.is study

Conflict of interest: Short intervention duration as patients did not stay in wards for more than 2 weeks.

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Ethical Clearance: The study was approved by the institutional ethics committee of KIMSDU.

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Impact of Thera-Pep and Forced Expiratory Technique in Chronic Bronchitis Patients

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Aim: To study the impact of Thera-Pep and Forced Expiratory Technique in Chronic Bronchitis patients.

Objectives: To find the effect of Thera-pep device in mobilizing secretion. To find the effect of forced expiratory technique in mobilizing secretion and To compare the effect of Thera-pep and forced expiratory technique in chronic bronchitis patients.

Materials and Method: 54 patients were included according to inclusion and exclusion criteria, were randomized by chit method into two groups. Group A (Forced Expiratory technique with coughing) and Group B (Thera-PEP device with coughing) - with 27 patients in each group. All the patients were assessed with Six Minute Walk Test (6MWT) and Peak Expiratory Flow Rate (PEFR). The treatment was given for twice a day for 6 days a week for 2 weeks. After 2 weeks, effect of interventions were assessed by 6MWT and PEFR.

Results: There was no significant difference in 6MWT and PEFR score in comparison of both experimental and conventional intervention. The inter group values of 6MWT and PEFR showed significant improvement in chronic bronchitis patients. The intra group values of 6MWT and PEFR showed no significant improvement in comparison of the techniques in chronic bronchitis patients.

Conclusion: Both the techniques are effective on removal and mobilizing of secretion individually in chronic bronchitis patients. However, the techniques when compared with each other were equally effective and there was no significant difference between each other.

Key words: *FET, 6MWT, Chronic Bronchitis, PEFR, Thera-PEP device.*

Introduction

Chronic obstructive pulmonary disease (COPD) is an illness which progresses in severity and needs lifelong treatment.[1] The signs and symptoms are observed over 40 years of age and in 10% of general population.[1] There occurs partial reversible flow restriction in the airways in pulmonary pathology.[2] Patient condition and disease prognosis depends on the severity of pathology and physiological changes, intensity of symptoms(chronic cough, sputum production, resting dyspnea and reduced working capacity), presence of non-pulmonary general pathologies (body mass loss and dysfunction of the musculoskeletal system with nutritional abnormalities) and co-morbid factors (osteoporosis, bone fractures, diabetes, chronic anemia, cardiovascular diseases, depression).[2] Inflammation of large and medium sized airway bronchi in the lungs is known as bronchitis.[2] The symptoms includes coughing up mucus, wheezing, shortness of breath, and chest discomfort.[3] Bronchitis is classified into two types: acute bronchitis and chronic bronchitis.[3] Chronic bronchitis (CB) is very common but changeable phenomenon in chronic obstructive pulmonary disease (COPD).[4] Chronic bronchitis is defined as a productive cough lasting for minimum of three months or more per year and consistent for at least two years.[4] It affects about a third of patients with COPD, but also occurs in individuals with normal lung function, with prevalence estimates varying widely both in population based studies (2.6-16%) and among COPD patients (7.4-53%).[5] Cigarette smoking is the most probable cause, with many other factors such as air pollution and genetics playing a smaller role. [5] The conventional treatments used include cessation of smoking, vaccinations, rehabilitation, and

inhaled bronchodilators and steroids via nebulizers. Also long-term oxygen therapy or lung transplantation may help in prognosis of the condition.[6] Positive expiratory pressure Thera-Pep device allows the entry of air to peripheral airways via collateral airways which creates pressure air to go behind the secretions. This will move the secretion towards the larger airways and expel out easily to prevent collapse of alveoli.[6] It is a portable device with easy to use technique so that patient with Cystic Fibrosis (CF), lung diseases with secretory problems, atelectasis, and patients recovering from surgery can use for mobilizing their secretions.[7] Forced Expiratory Technique (FET) with correct procedure and learning, this technique is most practiced and effective airway clearance technique.[7] This technique can be used as an individual technique or with different airway clearance techniques for mobilizing secretions.[8] It can be used as a stand-alone technique and also can be included in any airway clearance routine.[8] Huff is also known as forced expiratory technique with breathing control and mobilizes the secretions from lower to upper airways and expectorates them through mouth by coughing out.[9] FET is effective than coughing as it is less painful, less tiring, and creates less intracranial pressure inside skull.[9] Peak expiratory flow rate is the outcome measurement tool used to evaluate the maximum flow rate generated during forceful exhalation starting from full lung inflation.[10] It depends on the voluntary effort and muscular strength of the patient reflecting large airway flow.[10] The 6mwt is a submaximal exercise test used to evaluate the functional capacity of the patient. It measures the distance walked over a span of 6 minutes with various cardiopulmonary responses in the body. [10] It measures the response to therapy and prognosis of various cardiopulmonary conditions.[10]

This study examined the effect of Thera-PEP device in mobilizing secretion in chronic bronchitis patients. We also investigated the effect of Forced Expiratory Technique in mobilizing secretion in chronic bronchitis patients. As Chronic Bronchitis is a very common condition with progressive worsening of its symptoms. It needs effective treatment to control the symptoms and its complications which hampers the quality of life of the patient. Easy and beneficial technique may be effective in improving the quality and functional life of the patient. Therefore comparison of both the techniques has been done and given to patients respectively to check for the improvement in the functional capacity and quality of life of patient.

Method

Study type: Experimental study

Study design: Comparative

Sample size: 54 (27+ 27)

Place of study: Krishna Hospital , Karad

Criterion for Study

Inclusion criteria:

1. Confirmed patient diagnosis of chronic bronchitis.
2. Male and female patients.
3. Patients who can complete stage I of Bruce protocol.
4. Patients Haemodynamically stable and who are willing to participate in my study.

Exclusion criteria:

1. Patients who are in ICU with mechanical ventillatory support.
2. Unconscious, uncooperative patients.
3. Patients having grade IV dyspnea.
4. Patients having other respiratory complications secondary to chronic bronchitis.
5. Bedridden patients.
6. Recent facial, skull surgery or trauma.

Procedure

By using random sampling method the participants had been divided into 2 groups by chit method; Group A, Group B. subjects with confirmed diagnosis of Chronic Bronchitis with secretions and who are able to complete stage I of Bruce Protocol had been assessed by 6MWT and PEFR.

The intervention had been given for Twice a day for 2 weeks and treatment was given 6 times a week.

Intervention protocol for group A and group B

<u>GROUP A: Forced expiratory technique with coughing:</u>

Before starting the session, the technique and its physiology with diagrams which will help the patient to understand the need for monitoring the expiratory force were taught to the patient. Technique was taught in sitting position. Technique involved using 1 or 2 huffs from middle to low lung volumes, with the glottis open, followed by a period of relaxed-controlled diaphragmatic breathing with slow deep breaths. The patient then breathes quietly, at their own pace, for as long as is required and then coughing followed by huffing were performed. The session was carried out for (15-20 mins).

Group B: Thera-pep and coughing:

Patient is seated in upright or sitting position. The patient was instructed to slowly inspire to vital capacity and then hold the breath for about 3 seconds and then slowly exhales through the mouthpiece with the fixed orifice resister that creates an expiratory pressure resistance between 10–20 cm H_2O. The resistance can be increased or decreased according to the patient's condition. Then the patient performs slow deep breathing which was repeated anywhere from 10 to 20 times. Then a "cough" technique was done to clear secretions that have been mobilized from larger airways to central airways. Rest intervals for relaxation and breathing control for about 1–2 minutes were provided. Full expiration was explained to be avoided. Treatment session was given for about 15–20 minutes and this therapy duration and frequency were adjusted according to patient's condition. Sterilisation process after the use of Thera-PEP device was done in autoclave machine.

Outcome Measure:

1. **Peak Expiratory Flow Rate(PEFR):**

Peak Expiratory Flow Rate is the maximum flow rate generated during a forceful exhalation, starting from full lung inflation. PEFR primarily reflects large airway flow and depends on the voluntary effort and muscular strength of the patient. It is a portable flow gauge device (PFM). The PEFR measurement depends significantly on patient effort and technique. Clear instructions, accurate demonstrations, and frequent review of technique are essential. The position of patient while measuring PEFR is seated upright on chair.

2. **Six Minute Walk Test (6MWT):**

6MWT is a simple evaluative tool to asses functional exercise capacity that is the capacity of the individual to perform activities of daily living. 6MWT is a self paced test, which depends on various external factors like energy expenditure, encouragement of the therapist and motivation. It varies with age, gender, body weight, height. The patient is instructed to walk 60m yard (i.e; 30 m each lap) for 6 minutes without any symptoms or episodes of breathlessness. 6 MWT measures the heart rate, respiratory rate, oxygen saturation, blood pressure and distance walked before and after the treatment.

Results

Table 1: Comparison of PRE and POST intervention showing Mean, Median, p Value of PEFR and 6MWT of Group A and Group B respectively.

		MEAN ± SD	MEDIAN	p VALUE	t VALUE	dF
GROUP A PEFR	PRE	145.185 ± 44.235	150.00	P <0.0001	10.874	26
	POST	277.O37 ± 81.042	250.00			
GROUP A 6MWT	PRE	255.555 ± 91.161	240.00	P < 0.0001	16.142	26
	POST	307.037 ± 76.249	300.00			
GROUP B PEFR	PRE	141.111± 39.936	140.00	P < 0.0001	11.784	26
	POST	293.703 ± 79.863	270.00			

Cont... **Table 1: Comparison of PRE and POST intervention showing Mean, Median, p Value of PEFR and 6MWT of Group A and Group B respectively.**

GROUP B 6MWT	PRE	262.59 ± 93.99	240.00	P < 0.0001	15.834	26
	POST	312.22 ± 79.72	300.00			
GROUP A+ GROUP B	POST PEFR	277.03 ± 81.04	250.00	P =0.4500	0.7611	52
		293.70 ± 79.86	270.00			
GROUP A+ GROUP B	POST 6MWT	307.037 ± 76.249	300.00	P = 0.8080	0.2442	52
		312.22 ± 79.727	300.00			

Statistics

The outcomes were assessed at the 1st day prior to treatment and at the end of 2nd week post treatment. Intra group analysis was done by paired t test and Inter group analysis was done by using unpaired t test. The inter and intra group analysis was done by using Instat 3 application.

Discussion

Chronic Bronchitis patients experience a progressive deterioration and disability leading to worsening of their health related quality of life. Chronic Bronchitis is common but a variable phenomenon of COPD with numerous clinical consequences and reduced lung function with increase in airflow obstruction [1]

Forced Expiratory technique (FET) is a technique including huffs with controlled diaphragmatic breathing. In this technique mucus is separated from the bronchial wall and moved to upper airways where expectoration occurs with cough [2]. Thera-PEP device is an advance PEP device used in urban multi- Specialty Hospitals for airway clearance {2}.

The main purpose of the study was to examine the effect of FET and Thera-PEP device in chronic bronchitis patients. The objective of this study was to determine the effect of FET and Thera-PEP device individually in mobilizing secretion and to compare both the techniques in chronic bronchitis patients.

In the present study, there were 15 males and 12 females in group A whereas, 22 males and 5 females in group B. The mean age of group A and group B were 63.77 and 62.77 respectively.

In this, the effect of FET and Thera-PEP device in chronic bronchitis patients were investigated. They were investigated using PEFR and 6MWT. The intervention was given for 6 days a week, twice daily for 2 weeks. In group A FET with coughing was given and in group B the Thera-PEP device with coughing was given. Both the techniques were given in sitting erect position.

Post intervention it was found that there was significant improvement in both PEFR and 6MWT in both the groups individually. But when both the groups were compared, it showed no significant differences in PEFR and 6MWT between group A and group B. This may be because of both the techniques having final outcome by coughing out mechanism and another reason may be due to patients getting nebulizers and other medications which may have hampered the outcomes of PEFR and 6MWT.[3]

Also during intervention, patient had initially difficulty in coughing out due to dyspnea leading to changes in the baseline differences in the pre PEFR and 6MWT values. Patients were taught with instructions about the device and its usage in patients own language i.e; Marathi.[4]

Also while teaching the patients in rural area 'Karad' the patients initially did not understand the technique to use and apply Thera-PEP device with the breath hold mechanism. This lead to reduced differences in the PEFR and 6MWT values. So the patients were shown video clips of the Thera-PEP position and use to get a biofeedback of the Thera-PEP device.[5]

Patients were taught with instructions about the mechanism of the device in helping to mobilize the secretion and thus reducing the symptoms.[6]

It was difficult to treat dyspnea in grade 3 patients as it includes breath hold mechanism of 3 secs, and some patients were non –co-operative and some didn't do the intervention given independently, so once the therapist has taught how to do the conventional as well as the device usage prior intervention then the patient can effectively utilize the Thera-PEP device. Also some patients did not follow the instructions and protocol of the intervention i.e.; to do number of times in a day, which hampered the results of the study and recovery in the patients.[7]

The adaptation and independency of Thera-PEP device in rural population was good and can be advised for home care management for chronic bronchitis. Using Thera-PEP device gives a biofeedback to the patient and thus helps the patient recovery and independency.[8]

Utilizing Thera-PEP device in rural area "Karad" can be further studied considering the durability, feasibility and cost of the device.[8]

6 MWT and PEFR depends on various nutritional, psychological and comorbid factors which may be also the reason for no improvement. Also the intervention duration was for two weeks as patients in wards do not stay for more than two weeks, which may be a short duration for effectiveness of the Thera-PEP device.[9]

Thera-PEP device is commonly used in urban multispecialty hospitals and the awareness and usage of Thera-PEP device in rural population and the effectiveness of the device with conventional techniques was the purpose of the study

Elkins, Jones et al had also reported such a preference in favour of treatments that allow greater independence of using Thera-PEP device. It is of great importance that the effectiveness of the Thera-PEP for home physiotherapy is evaluated. Adherence over longer periods of time is important, but it is unknown that the Thera-PEP is more acceptable device for sustained use. Other factors to consider which could have impact on the uptake of Thera-PEP were its relative cost, durability, and ease of maintenance [10].

The small sample size and the short duration intervention may be responsible for the baseline differences that appeared to exist in the groups for PEFR and 6 MWT.[10]

In the present study, after comparing the results with the previous studies it suggests that both the techniques are equally effective for chronic bronchitis patients and on comparing there is no significant difference in both the groups.

Conclusion

Based on the statistical presentation, analysis and interpretation it can be concluded that both the techniques are effective on removal and mobilizing of secretion individually in chronic bronchitis patients.

The present study provided the evidence to support that both the techniques are effective on removal and mobilizing of secretion individually in chronic bronchitis patients.

However, the techniques when compared with each other were equally effective and there was no significant difference between each other.

Conflict of Interest: Short Intervention duration as patients did not stay in wards for more than two weeks.

Funding: This study was funded by Krishna Institute of Medical science Deemed to be University, Karad.

Ethical Clearance: The study was approved by the institutional ethics committee of KIMSDU.

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Critically Appraisal of Tools to Measure Using the COSMIN Checklist

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Abstract

Purpose: Oral health literacy tools are important for assessing a population's oral health knowledge and awareness. The objective of this study was to critically appraise the methodology used for developing all the existing oral health literacy assessment tools, by systematically reviewing the available evidence.

Materials & Method: Databases used for the search were Wiley, BMJ open, Pub Med/Medline and Science Direct. We identified 10 studies, published in English during 2006 – 2016, that focused on the development and validation of oral health literacy tools. We then assessed these studies using the COSMIN checklist, which evaluates the methodological quality of studies on measurement properties**.**

Results: Most of the tools were adapted from the general health literacy tool. All the 10 tools had measured validity and reliability, but lacked cross-cultural validity.

Conclusion: Findings from this review confirm that majority of the tools focus towards assessment of word recognition, numeracy and reading skills, rather than indicative of aspects such as health behaviors and service utilization. Developing tools that are adapted for specific populations will require further work, such as incorporating tests to ensure their acceptability and cultural competence.

Key-words: *Oral, health literacy, COSMIN checklist, tools, review*

Introduction

Oral health literacy (OHL) is defined as the 'degree to which individuals have the capacity to obtain, process and understand basic oral health information and services needed to make appropriate health decisions' [1] [2]. This ability to access and leverage oral health-related information and services serves as the most reliable indicator of oral health levels, since a high degree of OHL would correspond to a higher likelihood of good oral health being maintained. Being able to measure such an important indicator would prove to be extremely valuable in assessing overall oral health levels of a given population.

A number of tools have been developed to assess OHL levels of populations, of which the most widely used is the Rapid Estimate of Adult Literacy in Dentistry (REALD-99) [3], several variants of which were subsequently developed. Other popular tools, such as the Test of Functional Health Literacy in Dentistry (ToFHLiD)[4], the Comprehensive Measure of Oral Health Knowledge (CMOHK) [5] and the Health Literacy in Dentistry scale (HeLD) [6], have also been greatly successful.

A few reviews have been conducted for assessing OHL tools, including those by Dickson-Swift et al. (2014), and Navdeep Kaur and Daniel Kandelman (2015), which focus on what the different tools measure. However, no review has so far been conducted to evaluate the methodology used for developing these tools, which

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could help the researchers in understanding the critical points that are to be considered while planning the development of new tools.

This systematic review, hence, analyses, assesses and benchmarks all the currently available tools. The aim of this study is to critically appraise the methodology used for developing all the existing oral health literacy assessment tools, using the COSMIN checklist.

Materials and Method

This systematic review was conducted based on the five steps mentioned by [7]. The studies which emphasize on methodology of development and validation of different oral health literacy tools were included in the review. All other studies were excluded from the review during the step of screening. The final study selection was based on the inclusion and exclusion criteria mentioned in Table 1.

Table 1: Inclusion and exclusion criteria for the studies

Inclusion Criteria	Exclusion Criteria
1. Time period of studies from 2006- 2016. 2. The tools developed in different languages but published studies available in English language. 3. Studies based on development of Oral Health Literacy tools.	1. Tools adapted from an original tool. 2. Commentary articles/conference reports/theses/ workshop summaries

The research for the review was started with Google Scholar search and was completed with the help of Wiley, BMJ open and Pub Med/Medline databases. The key words used for the following search were 'health literacy', 'oral', 'development' and 'tool' with Boolean search strategy. MeSH term used was 'health literacy'. The time period selected for the review was 10 years. The search time frame was January 2006- April 2016.

Study selection

Using the search items selected for this review, 12585 turned up in the initial search. Then after applying various filters and removing duplicate studies, finally 10 studies were selected.

The quality of the studies selected were assessed based on the methodology used for the development of the oral health literacy tool in the particular study.

The Consensus-based Standards for the Selection of Health Measurement Instruments (COSMIN) checklist was used to evaluate the methodological quality of studies on measurement properties [8]. It is a valid and reliable tool for evaluating the methodological quality of health measurement instruments. The COSMIN uses a quality-rating system of nine domains including internal consistency, reliability, measurement error, content validity, structural validity, hypotheses testing, cross-cultural validity, criterion validity and responsiveness. Each domain is assessed with a series of questions that are scored on a 4-point scale from excellent to poor. For this review, studies that met the inclusion criteria were scored.

Results

In this review we identified all the original oral health literacy tools and analyzed the methodologies adopted to develop and validate such tools. We observed that the first tool developed was the REALD- 30 in 2007 as shown in Table 2, which was adapted from Rapid Estimate of Adult Literacy in Medicine (REALM). REALM was the commonly used tool for assessing general health literacy. REALD- 30 was based on word recognition tests that helped in merely assessing the reading ability of the population.

Other recently developed tools such as the Adult Health Literacy Instrument for Dentistry (AHLID) [9], Oral Health Literacy Adults Questionnaire (OHL-AQ) [10]including new measures of literacy skills (OHL Adults Questionnaire: OHL-AQ, etc. were also based on parameters such as reading comprehension, numeracy, literacy and decision-making (factual, procedural, and conceptual). Apart from these, population-specific tools such as the Hong Kong Oral Health Literacy Assessment Task for Pediatric Dentistry (HKOHLAT-P) [11] and Oral Health Literacy Inventory for Parents (OH-LIP) [12] were also developed, which helped in assessing the oral health literacy of parents/ children with respect to word recognition, vocabulary knowledge and comprehension. It did not measure the comprehensive skills.

Table 2: Overview of oral health literacy tools

Name of tool	Year	Authors	Type of tool
Multi-site assessment of oral health literacy	2016	Macek et al.	Conceptual model with 3 domains
Health Literacy in Dentistry (HeLD)	2014	Jones et al.	29 item- Modelled on the HeLMS
Adult Health Literacy Instrument for Dentistry (AHLID)	2015	Stein et al.	Based on an OECD instrument
Oral Health Literacy Adults Questionnaire (OHL-AQ)	2014	Sistani et al.	17 items in 4 sections, reading comprehension, numeracy, literacy and decision making
Hong Kong Oral Health Literacy Assessment Task for Paediatric Dentistry (HKOHLAT-P)	2013	Wong et al.	Literacy and numeracy tasks across three kinds of knowledge (factual, procedural, and conceptual)
Oral Health Literacy Inventory for Parents (OH-LIP)	2011	Richman	3 parts- word recognition, vocabulary knowledge, and comprehension of 35 terms used in paediatric dentistry
Oral Health Literacy Assessment-Spanish (OHLA-S)	2012	Lee et al.	24 items- word recognition and a comprehension section
Oral Health Literacy Instrument (OHLI)	2009	Sabbahi et al.	38 item- reading comprehension and 19 item-numeracy sections
Test of Functional Health Literacy in Dentistry (ToFHLiD)	2007	Gong et al.	Reading comprehension and numeracy 68 item reading comprehension and 12 item numeracy
Rapid Estimate of Adult Literacy in Dentistry −30 (REALD-30)	2007	Lee et al.	30 item word recognition common dental words

Discussion

The present review focused on how over the years, various oral health literacy tools have been developed/adapted from original tools. For instance, the REALMD-20 [17] has been adapted from the REALD-30. But unlike such adapted tools, most of the original tools which were developed later included different domains for assessing oral health literacy such as comprehension, knowledge, numeracy and vocabulary. In 2007, another tool was developed, namely the Test of Functional Health Literacy in Dentistry (ToFHLiD), which assessed the comprehensive and numeric ability of a population. The tool showed satisfactory levels of reliability and convergent validity. However, the ToFHLiD lacked test-retest reliability.

Also, there were no proper measures followed for assessing the psychometric properties of the tool. As a consequence, the results obtained from the REALD-30 and the inferences drawn from them would include a significant level of inaccuracy, and would not be a reliable indicator of the true extent of oral health literacy in the given population.

A study done by Mark D. Macek and his colleagues in 2016 was based on a multi-site investigation which included a conceptual model with three domains: Health Literacy (Domain #1), Behaviors/decisions (Domain #2), and Health Outcomes (Domain #3), influenced by selected oral health-related and socioeconomic status

(SES) covariates.

Most of these tools were adapted from existing tools which were originally developed for measuring general health literacy. For instance, the Health Literacy in Dentistry (HeLD) [6] was adapted from a general health literacy measure, the Health Literacy Management (HeLM) scale. Similarly, REALD was based on the Rapid Estimate of Adult Literacy in Medicine (REALM).

Despite successful adaptions of these original tools, however, it was observed in the review that all of the tools that were reviewed lacked cross-cultural adaptation. But there were a few tools which considered the importance of language in assessing the literacy of a population. The tools that were developed by [11] and [14], for instance, were translated into Mandarin and Spanish languages respectively.

In the past, there have not been many reviews for assessing oral health literacy tools. The results we obtained by means of this study were similar to those obtained from reviews done by [18] and [19], the latter of which states that none of the current tools offer an accurate assessment of oral health literacy level of a given population.

With this review we observed that there is a need of oral health literacy tools which are not only disease specific but consider all the domains of health literacy such as word recognition, comprehension, decision making etc. the tools should also be cross-culturally adapted for specific population.

One of the limitations of this review was that only original studies were considered for the purpose of the review. The various tools adapted from original tools were not considered.

Conclusion

Findings from this review confirm that majority of the tools focus towards assessment of word recognition, numeracy and reading skills, rather than indicative of aspects such as health behaviors and service utilization. Of late, attempts have also been made to incorporate other parameters into the development phase of the tool, which include parameters that are considered important, including decision making and possibly service navigation. The incorporation of these parameters should increase the validity of these tools as a measure of oral health literacy on a larger scale, as they are more capable of incorporating communicative/ interactional and critical nuances of oral health awareness. Efforts in the area of formal validation, however, are still required. In addition, further work would be required to develop tools that are adapted for specific populations, by incorporating tests to ensure their acceptability and cultural competence.

Ethical Clearance- Taken from M.S Ramaiah University of Applied Sciences Ethics committee

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Mental Toughness in Indian Elite Athletes: Psychometric Validation of the Psychological Performance Inventory

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Abstract

Background: Mental toughness is one of the psychological dimensions considered essential for performance in sports. In this study, the Psychometric validation of the Psychological Performance Inventory (PPI) was validated for the measurement of mental toughness in elite athletes. *Materials and method:* A sample of 76 elite athletes was selected via purposive sampling. To assess mental toughness, we used the Psychological Performance Inventory, by Loehr (1986). A confirmatory factor analysis was conducted to confirm the factor structure of the Psychological Performance Inventory in an Indian context. *Results*: The mean scores for negative energy control, positive energy control, attention control, and attitude control were 3.41 (SD = .18), 3.88 (SD = .23), 3.68 (SD = .15), and 3.86 (SD = .23), respectively. Only 29 items were adequately internally consistent in assessing mental toughness for Indian elite athletes. In composite reliability (CR), all factors had values above .85, indicating good reliability.

Conclusion: The lack of success among elite Indian athletes is their excessive focus on affective skills, neglect of cognitive skills. Balancing affective and cognitive skills is the way to improve mental toughness,

Keywords: *Affective, cognitive, Indian elite athletes, mental toughness, skill*

Introduction

In today's increasingly competitive games, the already thin margin between winning and losing (i.e., performance) is becoming progressively thinner. These decreasing margins are causing immense stress for athletes, as achieving the highest level of success requires a blend of complex technical skills, self-efficacy, and understanding the dynamic mental and physical environmental constraints.

Performance in competitive sports comprises three domains: technical movement or mechanics (skill), cognitive skills (ability to deal with the environment), and affective skills (an emotional component).[1,2]. An Aoyagi and Portenga have noted, 'successful performance requires both the development and mastery of knowledge, skills, and abilities and the capability to consistently and reliably deliver (i.e. perform) at the time of performance'. [3]

Contesting every athletic should have ability to manage the delicate mind–body connection, which becomes dramatically clear within the competitive arena.[4]

Sugarman reported that athletes often spend so much time on physical practice in order to gain an edge in competition that they end up ignoring another essential aspect of sports performance, namely, mental skills. A trained mind is essential to achieve this skill.[5]

Mental toughness is considered as an important psychological dimension for performance excellence. Mental toughness is used as a measure of the specific cognitive and affective skills that athletes must possess for good sports performance.[6-10]. Broadly, mental toughness has been denoted as the quality necessary to perform better than others in a competition or to perform well in a competition. [11,12,13]

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The cognitive aspect of mental toughness refers to the ability to deal with problems on and off the field [12] and deal with the pressure, negativity, and adversity [13-14] by staying calm and focused and maintaining belief in one's own plans and actions [6]. The affective aspect, on the other hand, refers to athletes' ability to remain motivated and confident[11] despite numerous failures on a daily basis, both during and after competitions.

Presently, most studies on mental toughness in Indian athletes focused on comparing mental toughness among various competitive levels of a single sport, such as the school, university, and national levels.[15-18] Few studies have examined how mental toughness correlation with other factors like win to win, winners to losers, anxiety state across various sports, such as badminton, gymnastics, athletics, and cricket[19,20]. There is no reported study on mental toughness and its correlations with various components of mental toughness.

This study was conducted to validate the PPI in the Indian context for elite athletes and to measure mental toughness and assess the psychological reasons for the poor performance of Indian athletes at the international level.

Materials and Method

The purposive sample of 76 elite Indian athletes competing at the national and international levels, in golf (n = 20), shooting (n = 15), track and field (n = 17), tennis (n = 5), squash (n = 2), wrestling (n = 4), swimming (n = 2), and boxing (n = 3) were included in the study. The sample was collected at various international competition events in India, such as the Indian Open golf tournament, the Women's Indian Open, the International Shooting Sport Federation (ISSF) World Cup, the Asian Athletics Championship, and various camps held for national players in competition at the international level.

The Psychological Performance Inventory (PPI; Loehr 1986) [21] was used to measure mental toughness. This 42-item scale yields a total mental toughness score, as well as seven 6-item subscale scores: (a) self-confidence; (b) negative energy control; (c) attention control; (d) visualization and imagery control; (e) motivation; (f) positive energy control; and (g) attitude control. Each item is rated on a five-point Likert scale anchored by 'almost always' and 'almost never'. The subscale scores range from 6 to 30 (with higher scores indicating more desirable levels), with total scores ranging from 42 to 210. The PPI has been found to be internally consistent, with Cronbach's alphas for the seven subscales indicating high reliability (self-confidence = 0.69; negative energy control = 0.42; attention control = 0.75; visualization and imagery control = 0.82; motivation = 0.70; positive energy control = 0.71; attitude control = 0.71). The PPI demonstrated acceptable psychometric properties when used on athletes performing at a National or international level [22,23]. PPI was selected because its subscales allow easy breakdown of items into affective and cognitive skills.

Procedure

Structural equation modelling (SEM) was employed to test the validity of the PPI using confirmatory factor analysis, which involves confirming how well the scale items fit the subscales (self-confidence, visualization and imagery control, motivation, positive energy control, negative energy control, attention control, and attitude control) forming the construct of mental toughness. First, the internal consistency was examined and maximized using Wille's stepwise procedure, which was repeated until removal of any of the remaining items in the scale did not lead to an increase in the corresponding subscale's alpha. Second, a partial least squares SEM (PLS-SEM) approach was used to determine whether the factor loadings of all remaining items in the final model of mental toughness were more than[5] which would indicate the presence of convergent and factorial validity. High internal consistency and reliability further serve as proof of construct validity.

Results

The obtained data was statistically evaluated with IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp using *t*-test, Cronbach's alpha coefficient Regression (β) path coefficients, at p value 0.05. The mean scores of self-confidence, visualization and imagery control, and motivation were 4.33 (SD = .16), 4.13 (SD = .20), and 4.56 (SD = .04), respectively. The mean scores for negative energy control, positive energy control, attention control, and attitude control were 3.41 (SD = .18), 3.88 (SD = .23), 3.68 (SD = .15), and 3.86 (SD = .23), respectively. Subscales of the PPI were significantly correlated ($p < 0.05$, Table 1).

Table 2 indicates the significance of reliability and validity of Psychological Performance. The internal consistency reliability of each of the seven subscales was good. Using Wille's method, we found that only 29 items were adequately internally consistent in assessing

mental toughness for Indian elite athletes. Regarding the composite reliability (CR), all factors had values above .85, indicating good reliability All subscales also had average variance extracted (AVE) values of greater than 59, indicating good convergent validity. To assess the common method bias, we used Harman's one factor test (based on a principal component analysis) to see if all the items loaded onto one factor. We found no common variance or a common latent factor (Table-3, 4).

Table 1: Descriptive statistics and correlations of Psychological Performance Inventory

Subscale	**Mean**	**Std. Deviation**	**SC**	**VI**	**ML**	**NE**	**PC**	**AC**	**AT**	**Cronbach's alpha**
Self-confidence (SC)	4.33	.16	.79 ***							.85
Visualization and imagery control (VI)	4.13	.20		.82 ***						.86
Motivation (ML)	4.56	.04			.74 ***					.88
Negative energy control (NE)	3.41	.18				.53 ***				.78
Positive energy control (PC)	3.88	.23					.53 ***			.74
Attention control (AC)	3.68	.15						.54 ***		.70
Attitude control (AT)	3.86	.23							.59 ***	.81

Table 2: Reliability and validity of Psychological Performance Inventory

	Self-confidence	**Visualization and imagery control**	**Motivation**	**Negative energy control**	**Positive energy control**	**Attention control**	**Attitude control**
Cronbach's alpha	0.85	0.86	0.88	0.78	0.74	0.70	0.81
Composite reliability	0.89	0.89	0.91	0.86	0.85	0.85	0.87
Convergent validity	0.62	0.59	0.67	0.61	0.65	0.75	0.63

Table 3: Factor loadings of Psychological Performance Inventory items after deletion of items with poor reliability and validity

Observed	Self-confidence	Visualization and imagery control	Motivation	Negative energy control	Positive energy control	Attention control	Attitude control
1		0.68	0.77	0.70	0.85		0.88
2	0.74	0.77	0.81		0.83		0.84
3	0.80	0.76	0.89	0.79		0.93	0.73
4	0.82	0.84	0.80	0.76		0.79	0.71
5	0.81	0.72			0.74		
6	0.74	0.81	0.82	0.84			

Table 4: Regression (β) path coefficients, t-statistics, and p-values for model paths obtained by estimating standard errors

Mental Toughness (PPI)	Original sample (O)*	Sample mean (M)	Standard deviation (STDEV)	t (|O/STDEV|)	p
Attention Control → Mental Toughness	0.09	0.08	0.04	2.038	0.043
Attitude Control → Mental Toughness	0.16	0.14	0.09	1.778	0.077
Motivation Level → Mental Toughness	0.28	0.27	0.06	4.572	0.000
Negative Energy Control → Mental Toughness	0.14	0.12	0.08	1.729	0.085
Positive Energy Control → Mental Toughness	0.12	0.10	0.07	1.715	0.088
Self Confidence → Mental Toughness	0.28	0.26	0.07	3.828	0.000
Visual Imagery → Mental Toughness	0.33	0.31	0.07	4.281	0.000

***Original Sample (O)**: Path Coefficients

Discussion

Mental toughness is a key quality for athletes, especially the elite level, where the margin for victory can be millimetres or milliseconds.

The PPI has been used in a number of empirical studies and is recommended as a useful instrument for assessing mental toughness. [21,22] We found that only 29 of the original 42 items of the PPI were relevant to measuring mental toughness in Indian elite athletes. Following removal of the other 13 items, we were able to confirm the convergent and discriminant validity of the seven factors through an examination of the individual parameter estimates. Furthermore, the internal

consistency coefficients of the seven factors were satisfactory, indicating that all subscales were internally consistent. Taken together, the scale items appeared to be suited to assessing mental toughness.

Affective skills help athletes maintain a strong faith in their ability to achieve a set goal, despite the low odds and lack of success [6]. This faith does not appear to fade even in the face of self-doubt about their performance or questions posed by others about their poor performance. These athletes remain in a state of optimal motivation, confidence, and control. [23] which helps them overcome and rebound from adversities and failure. In the present study, the subscales corresponding to the affective skills—motivational, visualization and imagery control, and self-confidence—made strong contributions to the construct of mental toughness among elite Indian athletes. Of these, self-confidence and visualization and imagery control were dominant, although motivation still had a high and significant contribution. By contrast, the cognitive skills of attitude control, positive energy control, and negative energy control did not have significant contributions; attention control did have a significant contribution, but it was somewhat weak. These findings show that the Indian athletes are continuously trying and motivated to achieve success via affective skills, rather than by relying on their cognitive skills.

However, during competition, the difference between winners and losers at the elite level is not a matter of motivation rather, it is down to their level of cognitive skills. Such skills allow athletes to assess and understand the situation, and then act accordingly. Numerous researchers have shown that successful athletes utilize cognitive skills to effectively deal with challenges, stressors, and pressure, irrespective of the prevailing circumstances [13]. Studies have also shown that reliance on affective skills particularly a higher motivational intensity can weaken cognitive skills and lead to poor decision making [24]. Higher-than-optimal motivational levels can make a person act hastily and hurry without analysing the situation; this makes them more result-oriented in their approach, as opposed to process-oriented. [25]

The results of this study might be useful for facilitating athletes' reflection on their lack of specific cognitive skills, which may be a reason for their limited success in international competitions. Athletes must be able to identify the most information-rich areas of their display, direct their attention appropriately, and extract meaning from these areas efficiently and effectively.

The psychometric support found for the PPI after item reduction in an Indian context can increase researchers' confidence in the instrument's usability to evaluate elite athletes in India in both future research and professional practice. It could be used in developing mental training programmes that place emphasis on assessing and training cognitive skill, in addition to affective skills.

The results of our study suggest that a probable cause of the lack of success among elite Indian athletes is their excessive focus on affective skills, neglect of cognitive skills, when they are developing mental toughness. Balancing affective and cognitive skills is the way to improve mental toughness, and may help to bring consistent success for Indian athletes at the international level.

Conclusion

The lack of success among elite Indian athletes is their excessive focus on affective skills, to the neglect of cognitive skills. Balancing affective and cognitive skills is the way to improve mental toughness,

Conflict of Interest- NIL

Ethical Clearance: It was obtained from Amity Institute of Psychology and Allied Sciences, Amity University Noida, UP, India

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An Assessment of Trust in Medical Profession amongst People Residing in a Semi-Urban Area, Tamil Nadu

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Abstract

Introduction: The fundamental basis in health care system and relationship is **Trust.** Trust is a set of expectations that the health care provider will do the best for the patient.The word "Trust" has been in a state of crisis over the last decade in India particularly in medical profession. Unlimited and implicit access to health care system and medical information from a varied range of source helps patients in one way and in contrary to that it may also misinform and adversely affect "Trust" in medical profession.

Objectives

- To assess trust in medical profession among people (>18years) residing in a semi urban area of TamilNadu.
- To assess the factors affecting Trust in medical profession.

Methodology: A community based cross-sectional study was conducted during February 2019 in Thirumazhisai , a semi-urban township in Chennai. 150 Men and Women above 18 years were included in the study. Data Collection was done using semi structured questionnaire. TMP(Trust in Medical Profession) scale was used to measure trust in medical profession.

Result: 56.4% have good trust on Doctors and 44.33% have trust lower than the expected score based on TMP scale. Trust was higher among unemployed, women , people below poverty line , those not suffering from chronic illness though statistical association could be established only with socio economic status(p 0.04) and system of medicine followed (p 0.01).

Conclusion: The trust in doctors have largely been reduced and hence understanding this would lead to better ways of responding to patients requests that preserve or enhance patients trust, leading to better outcomes.

Key words*: trust in medical profession, TMP scale, semi urban area.*

Introduction

The fundamental basis in health care system and relationship is **Trust.** Trust is a set of expectations that the health care provider will do the best for the patient. Research shows that the number of hospital jobs increased by 306% in 2015 and hence it's the high time that we focus on the basis "TRUST "[(1)]. The word "Trust" has been in a state of crisis over the last decade in India particularly in medical profession. Generally public in today's world have unlimited and implicit access to health care system and medical information from a varied range of source, this access helps patients in a way and in contrary to that it may also misinform and adversely

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affect "Trust" in medical profession. Views also varied by sex, age, health, education, income, number of visits/ years with physician, past dispute with a physician, and satisfaction with care [(2)]. Trust also depends on patients willingness to seek care , reveal sensitive information , submit to treatment and follow physician. Measurement of trust also suggest an important tool for monitoring performance of individual providers and health plans [(3)]. Trust in doctors is found to have five main domains: Fidelity, competence, honesty , confidentiality and global trust [(4)]. Importance of studying Trust is twofold – at macro-level , Trust is an indicator of support for the health system and changes in the health system and at micro-level, there is relationship between trust and peoples' behaviour in real choice situations.

Methodology

A community based cross-sectional study was conducted in Thirumazhisai, a semi-urban area of Chennai during February 2019. Thirumazhisai is the urban field practice area under department of Community Medicine , Saveetha Medical College and hospital. The study population included men and women who have completed 18 years of age residing in Thirumazhisai for more than 6 months. Sample size was calculated to be 150 using formula for cross sectional study with an anticipated population proportion of 40 % [(5)] , confidence level of 95% at 5% significance level and allowable relative error of 20%. A two stage sampling technique was used to enrol individuals to the study. There are 15 municipal wards in Thirumazhisai and each ward has 10 to 15 streets. At the first stage simple random sampling was done to select one street from each ward. A ward wise list of all the streets was prepared. One street was selected by lot method from each of the 15 wards . Systematic random sampling was done to select 10 households from each ward . The first family was selected randomly from street wise list of family folders maintained in Urban Health Centre of Saveetha Medical College at Thirumazhisai using random number tables. Every third house was visited starting from the randomly selected house till 10 houses were covered . Only one member (above 18 years) per household was chosen to avoid cluster bias.

Data was collected orally by interview method using structured questionnaire which included sociodemographic profile and TMP(TRUST IN MEDICAL PROFESSION) scale[(2)] to measure trust in Medical Profession. TMP scale is a validated 11-item 4 point likert scale

(Table 1) with responses grading from S*trongly agree, Agree, Disagree, Strongly disagree*. Here maximum score is 1 for strongly agree and 2,3 and 4 for agree, disagree and strongly disagree respectively. In the questionnaire the negative format question is also changed and recoded according to the format above. Total TMP score was calculated for each individual by adding the scores of the 11 questions. The maximum possible score would be 44 (least trust) and minimum score will be 11 (maximum trust) Mean score was taken as the cut off for categorising into good trust(a score less than mean) and reduced trust (score more than mean).

The study was initiated after obtaining approval from institutional ethical committee of Saveetha Medical College. Informed consent was obtained from the study participants and confidentiality of data was assured and maintained throughout the study. Data was entered in Microsoft Excel and analysed using SPSS software. Qualitative data is expressed as frequencies and proportions, quantitative data were summarised as mean (standard deviation). Chi-square test was applied for bivariate analysis to find association between Trust and qualitative factors like age category, gender, occupation, education, socio economic status (APL/BPL), presence of chronic disease and system of medication followed. Logistic Regression was done for multivariate analysis.

Results

A total sample of 150 people of both men and women above 18 years of age were interviewed. Analysis of the demographic data revealed that there were more number of women about 60.66% and males about 39.33%. Mean (SD) age of the study population was 43.3 (15.6). Majority of people interviewed were in the age group of 18-40 years of age(51.33%) . 38 % of the study population were unemployed followed by 23.3 % unskilled workers. 82% were educated till High school or above. 18 % were Below Poverty Line (BPL) with respect to the ration card that was possessed.

The mean(SD) TMP score of the study population was 21.3 (6.214). The maximum score obtained was 37 and minimum was 14. A score below mean (21.3)was considered as "Good Trust" for comparison purpose in our study . Among the study population 85(56.7%) individuals were found to have "good" trust in medical profession while 65 (43.3%) had reduced trust. When 61% of the males in our study population was found to

have good trust , only lesser number of females (53.84%) had good trust in Medical profession . While all the four participants above 80 years had good trust in Medical profession, 62.5% of those in the middle age group (40-60) had good trust. Trust did not vary significantly among the various occupational groups. Trust is higher amongst those belonging to below poverty line (74.1%) while only 52.8% of APL card holders were found to have good trust. Other factors influencing trust also were analysed and showed that trust has been slightly lower(51.1%) amongst people having at least one of the chronic diseases(hypertension, Diabetes Mellitus, cardiovascular disease, bronchial asthma) and it is 59.2% amongst people without any chronic disease .Trust also varied according to the system of medicine followed by the individuals as shown in Table 2.

Bivariate analysis was done using chi-square to test the statistical association between the various factors and trust in medical profession (table 2). Socioeconomic status (p value - 0.04) and system of medicine followed by the participants (p value- 0.010) had a significant association with Trust. Multivariate analysis by logistic regression with "good trust" as the dependant variable did not reveal significant association with any of the independent variables.

The most important quality of a doctor that can influence the trust in medical profession as perceived by the study participants were as follows: 44% of the participants perceived verbal communication as most important followed by behavioural competence(25%), comfort level(16%) and simple elegant appearance(15%). Question number 11 in TMP (table 1) which individually measures the over all trust showed that 74% of the study participants agreed that they "trusted their doctor completely".

Discussion

A cross sectional study was done to assess "trust in medical profession" among adults population in a semi-urban township of Chennai, Tamil Nadu. Proportion of females and unemployed persons were more in our study population when compared to census figures of Tamil Nadu.[6] This may be due to the reason that the data collection was done during day time when males who were engaged at their occupation were not available at household . In this study based on the score calculated trust in medical profession is found to be 56.7% have good trust and about 43.3% have reduced trust and which is similar to study conducted in China by Da-Hai Zhao et al showed that the 67% has strongly trusted and about 33% had reduced trust.[7] Since this is a cross sectional study, deducing a continuous trend in long term was not possible. Mean score in this study is 21.3 out of 44 and in the previous study by Da-Hai Zhao et al the mean score is 35.4 out of 50 (5 point likert 10 item scale)[8]. Here it's important to note that level of trust is good in middle age group (40-60) in this study and is compared to study conducted in north-east Poland by Marcinowicz et al[9] . Based on the Table- 1 ,question number 3 "Doctors are thorough and careful " scored the highest about 68% and shows that the public is confident with Doctors knowledge and which is one of the factor influences trust in medical profession. Question number 8 in Table 1 "Doctors use their best skills and efforts" scored the least about 42% and shows that public has less confidence in transparency and skills in medical profession. During interrogations some people have lower Trust but were reluctant to express to medical students. Here the reduced trust may be due to recent media coverage of unethical practices by the doctors.

Factors affecting trust was studied and there is statistical significance obtained between two independent variables, socio economic status and the system of medications followed and Trust. Economic factors were found to be determinant of trust in doctors by studies done by Birkha et al and Gopichandran[10,11] . Another study done in older population by Guerrero et al also showed similar result [12]. Consistent results with association of trust in medical profession and system of medicine were not available. In this study participants perceived verbal communication and behavioural competence as more important and physical appearance as less important factor in influencing trust. Similar results were seen in another study done in rural and urban setting of Tamil Nadu[13] .

One of the limitations of this study is that it was conducted in a single geographic area . The representativeness of study population was not adequate as the data collection was done during day time and hence the responses of males and working group could not be captured fully.

Conclusion

The final outcome from this study is that 56.7% has good trust and 43.3% have reduced trust in medical profession. Trust have been higher among unemployed,

women , people below poverty line, those following alternate systems of medicine and those not suffering from chronic illness though statistical association could be established only with socio economic status(p 0.04) and system of medicine followed (p 0.01). Doctor's verbal communication skills was perceived by majority(44%) of the study participants as the most important quality that would determine trust in medical profession which should be focused on . The study would recommend the medical professionals to build up a close relationship with their patients and be still more transparent to avoid unethical issues. The trust in doctors have largely been reduced and hence understanding this would lead to better ways of responding to patients requests that preserve or enhance patients trust, leading to better outcomes.

Table-1 : 11-item Trust in Medical Profession(TMP scale)

1.	Doctors care their patients health more than or as similar to their parents
2.	Doctors care more about their convenience than their patients medical need
3.	Doctors are thorough and careful
4.	Completely trust Doctors about which medical treatments are best
5.	Doctors are honest in telling their patients about different treatment option available
6.	Doctors think about what is best for their patients
7.	Doctors do not pay full attention to what patient tells
8.	Doctors use their best skills and efforts
9.	You have no worries on putting your life in Doctors hand
10.	Doctors would never mislead you about anything
11.	You trust your doctor completely

Table-2: Factors associated with trust in medical profession

Factors	**Good trust n(%)**	**Reduced trust n(%)**	**P value (chi-square)**
Age			
18-40	42(54.5%)	35(45.5%)	
40-60	30(62.5%)	18(37.5)	0.139
60-80	9(42.9%)	12(57.1)	
>80	4(100%)	0(0%)	
Gender			
Male	36(61%)	23(39%)	0.387
Female	49(53.8%)	42(46.2%)	
Occupation			
Professional	4(66.7%)	2(33.3%)	
Semi-professional	9(47.4%)	10(52.6%)	
Skilled	21(63.6%)	12(36.4%)	0.717
Semi-skilled	21(60%)	14(40%)	
Unemployed	30(52.6%)	27(47.4%)	
Socioeconomic status			
APL	65(52.8%)	58(47.2%)	0.044*
BPL	20(74.1%)	7(25.9%)	

***Cont...* Table-2: Factors associated with trust in medical profession**

System of medication			0.010*
Allopathy	65(55.6%)	2(44.4%)	
Homeopathy	1(12.5%)	7(87.5%)	
Ayurveda	15(71.9%)	6(28.1%)	
Unani	4(100%)	0(0%)	
Chronic disease			0.224
Present	24(51.1%)	23(48.9%)	
Absent	61(59.2%)	42(40.8%)	

***significant at p<0.05**

Figure-1 : Distribution of trust in medical profession

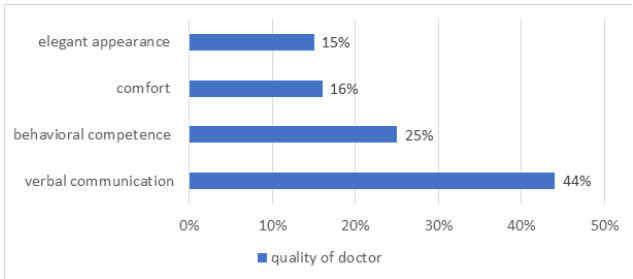

Figure-2 : Perceived quality of a doctor that influence trust

Conflict of Interest – NIL

Source of Funding- NIL

Ethical Clearance – Approval was obtained from Institutional Research Board of Saveetha Medical College and Hospital , Thandalam , Chennai.

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Effectiveness of Eccentric Exercises on Selfie Elbow

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Abstract

Background: Selfitis is an genuine mental condition where people have an obsessive-compulsive desire to take photos of one self and post them on social media as a way to make up for the lack of self- esteem. While clicking a selfie, there is always a possibility that by incorrect stretching of the tendons, an injury can occur to joints like the elbow. Selfie elbow is more of an abnormal and repetitive loading of muscles around elbow, leading to micro ruptures, which cause inflammation and pain. Hence, this study intended to analyze the effects of eccentric exercises on selfie elbow.

Aim: To analyze the effectiveness of eccentric exercises on selfie elbow.

Method: This is an experimental study done in Faculty of physiotherapy, Dr.M.G.R Educational and Research Institute. After approval of the study by Institutional Review Board, both male and female with severe selfitis (using selfie behaviour questionnaire) between 18-21 years having pain on lateral epicondyle & lateral forearm with positive cozens were included in the study. The subjects with any musculoskeletal injuries, neurological disorders and having pain due to other reasons were excluded. Eccentric exercises protocol was given for four weeks along with patient education program. All the exercises was performed 5times/weeks, 3 sets, 1 set = 15 rep, 1 min rest between each Set

Results: A Positive Association was found between the selfie behaviour scale & oxford elbow pain questionnaire in subjects with selfitis and on comparing the oxford elbow pain questionnaire score significant improvement in the post test mean value was seen which suggest that eccentric exercise program is effective in selfie elbow.

Conclusion: The result of this study suggests that proper patient education and eccentric exercise program among selfie takers with sefie elbow will reduce the pain over the lateral epicondyle.

Keywords: *Selfie, Selfitis, elbow pain, Selfie elbow, Selfie behaviour questionnaire, Eccentric exercises, Oxford elbow pain question*

Introduction

Selfitis is an genuine mental condition where people have an obsessive-compulsive desire to take photos of one self and post them on social media as a way to make up for the lack of self-esteem.[1] Selfie takers trust that selfies could boost their self-confidence, the number of positive comments and likes in social media will increase self-confidence level. It may lead to orthopedics complications like carpal tunnel syndrome, tennis elbow, frozen shoulder etc.[2] Like tennis elbow or golfer's elbow, an addition to selfie-taking can cause a pain in the elbow due to primary pic- snapping[3]. The selfie statistics indicated that about half (47%) of adults were taking selfies about 40% of people between 18 and 34 years admitted of taking selfies at least once per week. At the same time, women are believed to take selfies 1.3 times more than men[4].

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Taking selfies involves an unusual arm position with excessive forearm pronation and repeating the act eventually put strain over the elbow muscles and pressure on the bone, leading to inflammation and excruciating pain[5]. Due to this abnormal and repetitive loading of muscle there are micro ruptures around the elbow even by minimal stress[3]. The smart phone is not that heavy but during selfie the wrist is in awkward position that will lead to injury, so using selfie stick while taking selfie will reduce injury. The proper positioning of elbow and patient education can reduce the risk of selfie elbow. Clinical signs make diagnosis and symptoms that are discrete and characteristic with the elbow fully extended, the patient feels point of tenderness over the affected point on the elbow, which is the origin of the extensor carpi radialis brevis muscle in the lateral epicondyle. There is also pain with passive wrist flexion and resistive wrist extension.

Eccentric exercise can help to heal tendon injury including chronic tendinitis[6]. It effectively lengthens muscle tendon, increase tensile strength of the tendon, and reduce pain[7]. Eccentric exercises provide neuromuscular benefits through central adaptation of both agonist and antagonist muscles[8]. It also provides structural and functional benefits during tendinopathy rehabilitation[9]. It will increase the muscle strength[10].

Selfie behaviour scale appears to a reliable and valid instrument that was used in this study for assessing selfitis and categorizing the disorder of selfitis into borderline, acute and chronic selfitis. Pre and post selfie elbow pain was assessed using oxford elbow questionnaire. The Oxford elbow questionnaire comprises three unidimensional domains: elbow function, pain and social-psychological, with each domain comprising four items with good measurement properties. As there is dearth of research on selfie elbow, this study intended to find whether eccentric exercise is effective in reducing the symptoms of selfie elbow.

Methodology

This is an experimental study done in Faculty of physiotherapy, Dr.M.G.R Educational and Research Institute. After approval of the study by Institutional Review Board, both male and female with severe selfitis (using selfie behaviour questionnaire) between 18-21 years having pain on lateral epicondyle & lateral forearm with positive cozens were included in the study. After the initial assessment the pretest score of elbow pain questionnaire was taken for all the subjects. Then all the subjects underwent 4 weeks of eccentric exercise training program. All the exercises were performed 5 times a week, 3 sets with 1 min rest between each set (1set = 15 rep). The patient education program regarding proper positioning of mobile phone for taking selfie was given. At the end of 4 week, the posttest score of elbow pain questionnaire was taken.

Eccentric Exercises:

PHASE:1 With forearm supported on a table, the subjects were asked to lift the wrist up with the unaffected hand.	PHASE:2 The subjects were asked to take the unaffected hand away and slowly lower and repeat this process for each repetition.

Addition of Weights:

PHASE:1 The subjects were asked to keep the elbow at 90 degrees and locked in at the side and hold the weight with the forearm in a neutral position.(palm neither facing floor or ceiling and lift the wrist up and down.	PHASE:2 The subject were asked to turn the forearm so that your palm faces the ceiling. Return to the starting position. Repeat this process for every repetition.

Patient Education

Pre selfie stretches*:* Stretch wrist extensor and flexors muscles priors to clicking selfies.

Alternate the arms*:* Keep switching your arm to prevent over stress

Use bilateral arms*:* Prefer using both arms instead of over using dominant arm.

Selfie sticks: Prefer using selfie stick instead of extending your elbow.

Avoid prolonged posture maintenance*:* Keep changing your posture.

Data Analysis

The collected data were tabulated and analyzed using both descriptive and inferential statistics. All the parameters were assessed using statistical package for social science (SPSS) version 24. Paired t-test was adopted to find the statistical difference within the groups & Pearson Correlation of coefficient was adopted to find the Correlation between Selfie Behaviour Scale & Oxford Elbow Pain Questionnaire.

Table - 1: Pearson Correlation of Coefficient between Selfie Behaviour Scale & Oxford Elbow Pain Questionnaire in Subjects with Elbow Pain.

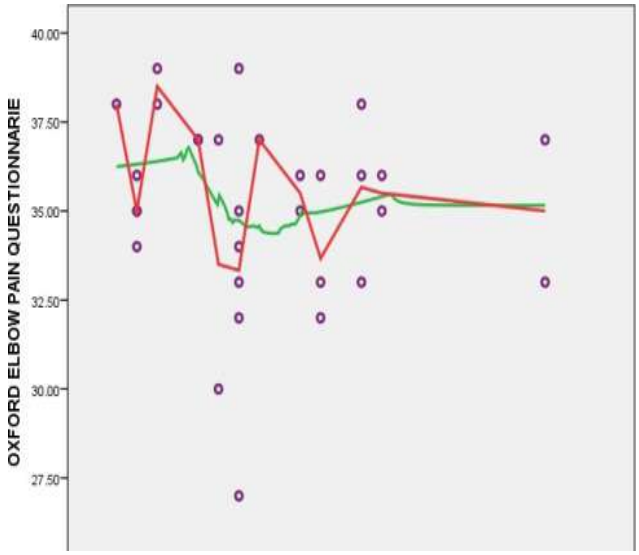
Parameters	Subjects	
	'r' value	P value
SBS	0.417	≤ 0.05
OEPQ	0.555	≤ 0.05

(#SBS - Selfie Behaviour Scale, OEPQ - Oxford Elbow Pain Questionnaire)

The above table reveals the Pearson Correlation of coefficient ' r ' value and p-value within subjects between Selfie Behaviour Scale & Oxford Elbow Pain Questionnaire**.**

There was a positive correlation between Selfie Behaviour Scale & Oxford Elbow Pain Questionnaire in subjects with selfitis. The Selfie Behaviour Scale had the strongest correlation with Oxford Elbow Pain Questionnaire within subjects. **(P ≤ 0.05)**

(Graph-II)



Graph - I: Pearson Correlation of Coefficient between Selfie Behaviour Scale & Oxford Elbow Pain Questionnaire in Subjects with selfitis.

Table - 2

#OEPQ	PRE TEST		POST TEST		t – TEST	SIGNIFICANCE
	MEAN	S.D	MEAN	S.D		
SUBJECTS	35.10	2.68	57.10	2.48	-35.83	.000***

OEPQ - OXFORD ELBOW PAIN QUESTIONNAIRE SCORE

(*- P ≤ 0.001)**

The above table reveals the Mean, Standard Deviation (S.D), t-value and p-value within subjects between pre-test and post-test values.

Oxford Elbow Pain Questionnaire Score shows that there is a statistically highly significant difference between the pretest and posttest values within subjects

(***- P ≤ 0.001).(Graph-I)

Results

A Positive Association was found between the Selfie Behaviour Scale & Oxford Elbow Pain Questionnaire in subjects with selfitis. The Selfie Behaviour Scale had the strongest correlation with Oxford Elbow Pain Questionnaire within subjects at **(P ≤ 0.05).**

On comparing the Oxford Elbow Pain Questionnaire Score within Subjects between Pre & Post Test Values, it shows significant improvement in the Post Test Mean values **(57.10)** when compared with pre test mean values **(35.10)** at **P ≤ 0.001.** Hence Null Hypothesis is rejected.

Discussion

While clicking a selfie, the awkward position of arm and repetitive loading of muscles around the elbow leads to micro ruptures, which cause pain and inflammation around the elbow. Hence, this study intended to analyze the effects of eccentric exercise on selfie elbow.

The common symptom reported by the subjects where pain and tenderness over the extensor origin. The reason behind this seems to be abnormal stretching of tendon and repeated high movements of force beyond the adaptive capacity of the tissue because progressive degeneration as previously stated by Lee DG[11]. In most of the subjects, tenderness was present over the lateral epicondyle. It is because the muscle undergoes micro rupture easily at its attachment to the bone rather than at muscle belly.

P.Malliaras et al in his study stated that eccentric exercises help to reduce and manage tenderness and pain by increasing the strength at the angle of contraction without producing any discomfort or worsening the inflammatory[12]. The findings of this study was similar to that showing reduction in intensity of pain after the eccentric exercise training. The loads of exercises were increased as the patient symptoms declined. Patients performed the exercise at low speed, because slow and static stretching enhances tissue healing and gives comfort to the patient.

In this study patient who followed the patient education after the eccentric exercise training reported less recurrence of pain. Charles kim suggested that the selfie takers, using a selfie stick can work like an arm extensor and take the pressure off the elbow and stretching the wrist extensor and flexors before taking selfie and alternating and using bilateral arms while taking selfie prevent over stress on elbow[13].

This study revealed that through proper patient education and eccentric exercise training the occurrence of selfie elbow can be reduced.

Conclusion

This study reveals that there is a strong correlation between selfitis and selfie elbow and proper positioning of the mobile phones during selfie taking and exercise training can prevent its occurrence.

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Evaluation of Cyclic Fatigue Resistance of Three Different Niti Rotary Systems-An Invitro Study

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Abstract

Aim: The aim of this study is to compare and evaluate the cyclic fatigue resistance of 3 different Nickel Titanium rotary file systems: Hyflex CM, Neoendo Flex files and ProTaper Gold by static method in three different curvatures, namely, 45º,60º and 90º.

Materials and Method: Thirty Hyflex CM (25/.06), Thirty Neoendo Flex (25/.06) and Thirty Protaper Gold (25/.08) instruments were included in this study. The static cyclic fatigue test was performed using a custom-made jig. The artificial canal is made of stainless steel jig with an inner diameter of 1.5mm, a 45^0, 60^0, 90^0 angles of curvature and radii of curvature of 5 mm. All the instruments were rotated according to manufacturer's recommendations until failure occurred. The time taken to failure was recorded in seconds for each group using a digital chronometer. The data were analyzed statistically using one way ANOVA, Post hoc test of Bonferroni was performed to identify pair-wise significance via SPSS 21.0 software (SPSS Inc, Chicago, IL). The statistical significance was set at 5%.

Result: In 45º and 60º Hyflex CM and Neoendo Flex are better than Pro Taper Gold. At 90º, Neoendo Flex is better than Hyflex CM ($P< .05$)

Conclusion: Within the limitation of this study, it can be concluded that, Neoendo Flex files exhibited highest cyclic fatigue resistance at 90º angle of curvature. In 45º and 60º angle of curvature Neoendo Flex files and Hyflex CM rotary instrument were more resistant to cyclic fatigue. Protaper Gold showed the least cyclic fatigue resistance than the other files tested.

Key Words: *Cyclic fatigue, Nickel Titanium alloy, Neoendo flex, Protaper Gold, Hyflex CM, Instrument design.*

Introduction

The introduction of nickel-titanium rotary (NTR) instruments have vastly influenced endodontic practice by the virtue of its speed, quality, accuracy, and reduction in risk during the vital phase of chemo mechanical root canal preparation.[1]

NiTi instruments are relatively superior to previously used manual stainless steel instruments and its use increases the success rate of root canal treatment compared to stainless steel hand instruments.[2]

In spite of their advantages, NTR instruments possess a high risk of fracture, especially in curved canals. Instrument fracture in clinical practice used multiple times has an incidence of 0.39% to 21% (Shen et al.2013) The problem is compounded by sudden, unexpected fracture without any previous permanent deformation or another visible warning signs. Radius and angle of curvature, instrument size and cross-sectional area, rotational speed, design, technique and operator experience, torque, metal surface treatments,

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and metallurgical characterization of the NiTi alloys are the variables that contribute to file separation.[3]

Though both flexural fracture and torsional fracture occur simultaneously, studies have found cyclic fatigue to be the cardinal cause of file separation accounting for 50% - 90 % of mechanical failures.[4]

The cyclic fatigue resistance is improved by altering the metallurgy, design, kinematics of the files and heat treatment of file.[5]

Hyflex CM (Controlled Memory) NiTi files (Coltene / Whaldent, Switzerland) was introduced in 2010. This CM thermomechanical surface treatment makes the files extremely flexible without rebound providing superior canal tracking and more resistance to cyclic fatigue than non –CM NiTi files.[6]

Neoendo flex files(Orikam Healthcare India Private limited) are recently introduced files designed with a triangular cross section and a proprietary heat treatment rendering them highy flexible. The manufacturers also claim that the flutes do not open when the stress level is reached, which helps in increasing the cyclic fatigue resistance.

Protaper Gold (PTG, Dentsply Tulsa Dental Specialties) has a convex triangular cross-section and a variable progressive taper. PTG is manufactured by proprietary metallurgy that reportedly increases its flexibility and its resistance to cyclic fatigue.[7]

There are no studies in the literature that evaluates the cyclic fatigue resistance of these new rotary file systems. Hence, the aim of the present study is to compare the cyclic fatigue resistance of three different NiTi rotary file systems: Hyflex CM, Protaper Gold and Neoendo Flex files.

Materials and Method

A total of 90 NiTi instruments of 3 different rotary systems of length 21mm were included in the present study. Before testing, all files were autoclaved and examined using a stereomicroscope to detect any deformation. The files were divided into 3 experimental groups (n = 30) as follows: **Group A:** Hyflex CM instruments of size 25, 0.06 taper **Group B:** Neoendo Flex files instruments of size 25, 0.06 taper **Group C:** Protaper Gold instruments of size 25, 0.08 taper

Cyclic fatigue testing device:

The static cyclic fatigue test was performed using a custom-made jig fabricated for this study. The artificial canal was made of stainless steel, with an inner diameter of 1.5 mm, total length of 20 mm and an arc at the end with a curvature radius of 5 mm which simulates the instrument size and taper. This steel jig was constructed in order to retain the rotary instruments within the canal groove by means of a metal frame. It is enveloped by a glass fiber screwed on either side in order to prevent the instrument from distortion. The jig is constructed with 5mm radius of curvature and 45º, 60º and 90º angles of curvature to provide a suitable trajectory with curved segment of canal being 6mm in length (Figure 1).

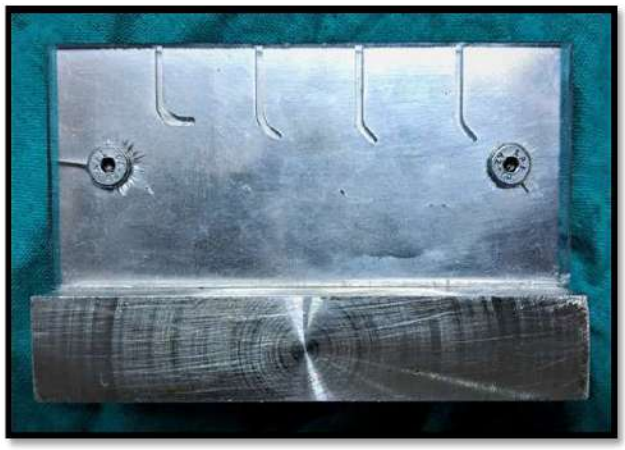

Figure-1: Customized Jig

The dental hand piece (16: 1 reduction hand piece) was attached to the descending cross head of the Instron(8874) testing machine (Boston, US) (Figure 2&3a).

Figure-2: INSTRON (8874) testing machine

Figure-3a: Before failure

Cyclic fatigue test

All the instruments groups (n=90) was tested according to manufacturer 's recommendations as follows: Hyflex CM at 500rpm/2.5Ncm; Neoendo Flex at 350rpm/1.5Ncm; Protaper Gold at 300rpm/1.5Ncm until failure occurred(figure-3b). The time taken to failure was recorded and stopped as soon as the failure was detected visually and/or audibly with the help of computer aided software (figure-3c). The failure was easily detectable because the tip of the instrument was visible at the end of the curve (Figure 4a, 4b, 4c).Mean values were then calculated. The formula to calculate number of cycles to failure (NCF) is **NCF = revolutions per minute × time to failure (seconds)/60**

Figure-3b During procedure **Figure-3c: After failure**

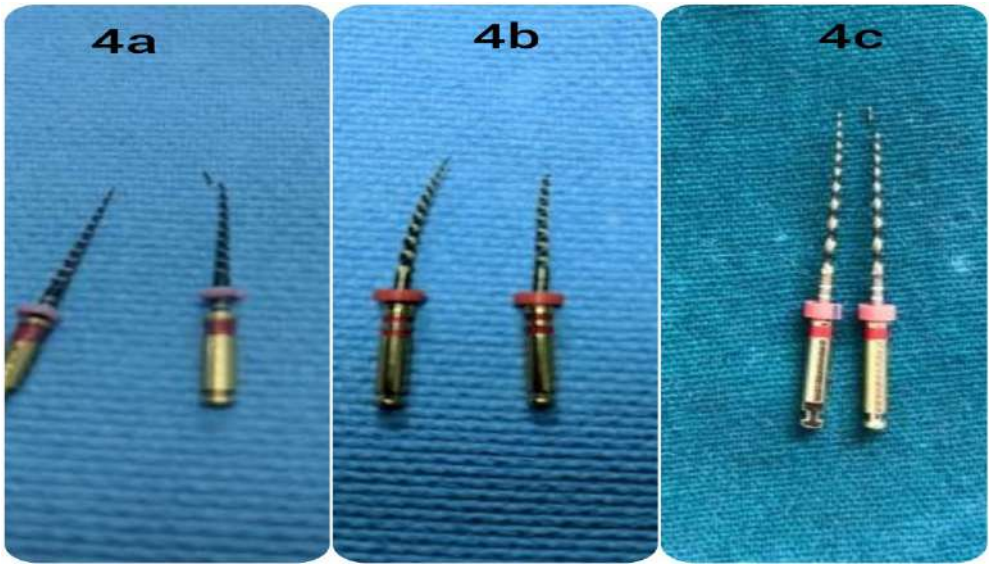

Figure-4 Instruments before and after testing
4a-HyflexCM;4b-Neoendoflex;4c-Protaper Gold

Statistical Analyses

The mean, standard deviation and standard error of the three groups were calculated. The mean time taken to failure (seconds) and the number of cycles to failure were statistically analyzed using SPSS software 21.0 version (SPSS Inc., Chicago, IL). One - way ANOVA was done to determine significant differences among the systems, between groups and within groups. When the overall *F* test indicated significant difference, Post Hoc test of Bonferroni was performed to identify pair wise significance. The criteria for statistical significance *P* value < 0.05.

Result

A statistically significant difference was observed in the mean number of cycles to failure (NCF) between the three groups tested (P< 0.05). The result showed Hyflex CM and Neoendo Flex to be better than Pro Taper Gold at 45º and 60º, (Table-1&2) whereas at 90º Neoendo Flex performed better than Hyflex CM (Table-3).

Table 1: Pair wise comparison of Hyflex CM, Neo Endo Flex and Pro Taper Gold files placed at 45º

	(I) File name	(J) File name	Mean 0Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
450	Hyflex	Neo Endo	112.900	56.225	.164	-30.61	256.41
		Pro taper Gold	280.200*	56.225	.000	136.69	423.71
	Neo Endo	Hyflex	-112.900	56.225	.164	-256.41	30.61
		Pro taper Gold	167.300*	56.225	.018	23.79	310.81
	Pro taper Gold	Hyflex	-280.200*	56.225	.000	-423.71	-136.69
		Neo Endo	-167.300*	56.225	.018	-310.81	-23.79
*The mean difference is significant at the 0.05 level.							

Table 2: Pairwise comparison of Hyflex, Neo Endo and Pro Taper Gold files placed at 60 degrees

Angle	(I) File name	(J) File name	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
60º	Hyflex	Neo Endo	97.300	54.851	.262	-42.71	237.31
		Pro taper Gold	164.900*	54.851	.017	24.89	304.91
	Neo Endo	Hyflex	-97.300	54.851	.262	-237.31	42.71
		Pro taper Gold	67.600	54.851	.685	-72.41	207.61
	Pro taper Gold	Hyflex	-164.900*	54.851	.017	-304.91	-24.89
		Neo Endo	-67.600	54.851	.685	-207.61	72.41
*The mean difference is significant at the 0.05 level.							

Table 3: Pairwise comparison of Hyflex, Neo Endo and Pro Taper Gold files placed at 90 degrees

Angle	(I) File name	(J) File name	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
90º	Hyflex	Neo Endo	-180.300*	64.096	.027	-343.90	-16.70
		Pro taper Gold	-38.900	64.096	1.000	-202.50	124.70
	Neo Endo	Hyflex	180.300*	64.096	.027	16.70	343.90
		Pro taper Gold	141.400	64.096	.108	-22.20	305.00
	Pro taper Gold	Hyflex	38.900	64.096	1.000	-124.70	202.50
		Neo Endo	-141.400	64.096	.108	-305.00	22.20
*The mean difference is significant at the 0.05 level.							

Discussion

The clinical performance of endodontic files and their resistance to fracture by torsion and/or cyclic fatigue are mainly affected by variables, such as instrument size, taper, cross-sectional design, and manufacturing techniques.[8] for this reason, many studies are performed on the cyclic fatigue resistance of NiTi rotary files. Manufactures aim to improve the cyclic fatigue resistance of NiTi rotary files by altering the design, metallurgy and kinematic of the files and through the various thermal and surface treatments applied to the files. This study is the first to compare cyclic fatigue resistance of Neoendo flex, Protaper Gold, Hyflex CM using a well-established cyclic fatigue model

Several non-tooth devices were used to investigate the *in-vitro* cyclic fatigue resistance in both static and dynamic models. In a static model, the instrument does not move axially. Therefore, this creates alternate compressive and tensile stresses in a particular area of the instrument leading to premature failure.[9] Thus in this study, a static model was preferred because the instruments being tested could be constrained in a precise trajectory and to rule out the confounding factors caused by other mechanisms of instrument separation apart from cyclic fatigue.

Cyclic fatigue resistance refers to the number of cycles to failure that an instrument is able to resist under a specific loading condition. In this study, the fatigue life of the instruments was evaluated by multiplying the rotational speed by the time elapsed until failure.[10]

The rotational speed at which NiTi rotary instruments should be driven is a variable that remains to be clarified. Ideally, rotary instruments should be used at a rate that minimizes the incidence of fracture while maintaining efficiency. De -Deus et al., (2010) stated that higher rotational speeds are more susceptible to fracture than

lower rotational speeds. Hence in this study, continuous rotations according to manufacturer 's recommendations was delivered using endodontic motor (X - Smart™ Endomotor with 16:1 reduction handpiece, Dentsply, UK). Synthetic oil was applied as recommended by Grande et al., (2006) to reduce the friction of the file.

The result of this study showed that Neoendo Flex (#21.06) had higher cyclic fatigue resistance values than the other groups. Thus, the null hypothesis was rejected. The Hyflex CM, Neoendo Flex, and Protaper Gold instruments have the same tip sizes (#25). However, the tapers differ among them; Hyflex CM and Neoendo Flex have a taper of 0.06 mm/mm, and ProtaperGold has a taper of 0.08 mm/ mm. The lower taper value of Hyflex CM and Neoendo Flex when compared with Protaper Gold should ensure a higher cyclic fatigue time; nevertheless, our results showed that only Neoendo Flex presented better results than Hyflex CM and Protaper Gold in 90º angle of curvature. In addition, the Hyflex CM group showed a significantly higher cyclic fatigue resistance value than the Protaper Gold group ($P < .05$) in all three subgroups. Other variables, such as cross -sectional design, and manufacturing process should also be taken into account. The results of this study were probably caused by the different cross –sectional designs and types of NiTi alloy of the instruments, which affect the mechanical properties of NiTi instruments.[11]

A study using a finite elemental analysis demonstrated that a triangular cross-sectional design possessed a higher cyclic fatigue resistance than a square and rectangular cross-sectional design.[12] This difference is related to the reduced metal mass of the instruments with a triangular cross-section compared with that of instruments with other cross-section design. Hence, we have chosen files Hyflex CM and Neoendo Flex files with triangular cross sections and Protaper Gold with convex triangular cross section.

This study showed that its results are in accordance with the study done by Kim et al., (2008) in which they have shown that the Convex Triangular design at the tip of the file showed significantly higher von Mises stress values when compared with the Triangular group and they stated that the outcome of the study may be due to the presence of internal residual stresses indicating that the file has undergone cold work during loading, which eventually led to reduced flexibility at the cutting edge.

Hyflex CM and neoendo Flex files with triangular cross section had higher fatigue resistance than Protaper Gold which has convex triangular cross section. NiTi instruments with larger cross-sectional areas present lower cyclic fatigue resistance.[13] Therefore, this could contribute to the difference in cyclic fatigue resistance of these instruments.

The mechanical properties of NiTi instruments are affected by the type of alloy used in the manufacturing process (Zhou H., Shen Y., 2012) and also proprietary surface treatments. Hyflex CM was manufactured by controlled memory wire technique, whereas Neoendo and Protaper Gold are subjected to gold surface treatment. Since the manufacturers do not reveal the manufacturing process of newer rotary files systems, we could not relate the effect of these manufacturing processes in improving the cyclic fatigue resistance.

The clinical implication of this study is that Neoendo files can be preferred in all types of canal curvatures including severely curved canal as it had the highest cyclic fatigueresistance in all angles of curvature such as 45º, 60º, and 90º. Another advantage of Neoendo Flex files are that they are cost effective and hence can be preferred in all clinical situations. In this study, Hyflex CM is found to have good cyclic fatigue resistance in curved canals in accordance with the previous studies. Though Hyflex CM can be used in mild to moderately curved canals, it should be used with causation in severe acute curvature as the cyclic fatigue resistance of Hyflex CM is less compared to Neoendo flex files in 90º curvature. In this study, Protaper Gold had least resistance when compared to Hyflex CM and Neoendo Flex in all types of canal curvatures. So Protaper Gold has limited use in curved canals.

Conclusion

Within the limitations of this study, it can be concluded that, Neoendo Flex files exhibited highest cyclic fatigue resistance than the Hyflex CM and Protaper Gold file systems at 90º angle of curvature. In 45º and 60º angle of curvature Neoendo Flex files and Hyflex CM rotary instrument were more resistant to cyclic fatigue followed by Protaper Gold file systems . Protaper Gold showed the least cyclic fatigue resistance than the other files tested.

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Prediction of Normal & Grades of Cancer on Colon Biopsy Images at Different Magnifications Using Minimal Robust Texture & Morphological Features

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Abstract

Classification of colon biopsy images to normal and various cancer grades is a pivotal task for histopathologists as it involves visual analysis under the microscope at different magnifications and hence may give rise to observational inconsistency. This paper emphasis on categorization of colon biopsy images into normal, well, moderate and poor classes thereby analyzing the best magnification and classifier suited for classification. A hybrid feature set consisting of morphological and texture features are obtained from images followed by class balancing to overcome imbalancing problem and then optimized feature selection. Classifiers such as SVM, Random Forest, Multilayer Perceptron and Naive Bayes are experimented for classification. The proposed model is evaluated with colon biopsy images acquired from Aster Medcity, Kochi, India at different magnifications 10X, 20X and 40X where all the magnifications performed well, but 20X gave an improved accuracy of 94.27% with the Random Forest classifier. Advance measures based on entropy triangle are used to rank classifiers apart from the standard performance measures, where Random Forest classifier is best for the proposed model for all magnifications.

Keywords: *Colon biopsy image, cancer, Texture, Morphology, Features, Classification, Normal, Malignant, Magnification*

Introduction

One of the leading cancers that occur today is colon cancer and its second cause for death and third incident cancer worldwide[1]. Identification of colon cancer is performed by microscopic study of biopsies of colon which are obtained either through surgery or colonoscopy. Further pathologist manually examines the structure of colon tissues through microscope and then detects the presence of cancer by analyzing the shape of tissue and degree of distortion to assign different grades to the cancerous ones. This analysis is subjective as pathologist observes the morphology of tissues and grades them accordingly and also lead to inter and intra observer variability[2,3]. Thus an automated diagnostic support system is needed to detect and grade colon cancer, thus overcoming the limitations of manual process and hence assist pathologist[4].

Existing Method

In colon cancer identification techniques, various investigations are done and detailed survey of them are summarized in [5] where simple texture and object-oriented texture-based techniques performed well. Colon Cancer detection techniques[6, 7], based on texture, morphological, geometric features are extracted on single magnified images. However, in [8], different magnified images were used for segmentation and classification. In the initial experiments of[9, 10] combined texture and morphological feature set gave better classification of 91.3\% with Multilayer Perceptron classifier for 10X magnification.

Apart from colon cancer detection techniques, some grading techniques of the malignant colon images are proposed. In [11,12] grading was done with single magnified images based on Haralick, statistical moments of intensity, morphological and topological features. Later classification and grading of colon

images were done with single magnification[13] where 95.4% of detection and 93.47% of grading efficiency was obtained. Multiclass classification based on texture analysis was done[14] where 87.4% was obtained.

In this paper, multiclass classification of colon images into normal and different grades is proposed depending on the texture and morphological features. Class balancing of the image dataset is addressed to avoid imbalance data problem where results are skewed towards majority class. With attribute selection, only the contributing features are considered for classification from rich hybrid feature set of texture and morphological features. Different classifiers are analyzed to know their performance. The work will be evaluated on colon images taken at different magnifications from Aster Medcity, Kochi, India to analyze the best magnification for the proposed model. Apart from standard performance evaluation measures, information theoretic measures will be experimented for the multiclass classification. The results indicate the proposed model performs more accurate where the best magnification of images and classifier are identified.

Proposed Method

The framework of the proposed system consists of four stages namely (1) Pre-processing (2) Feature Extraction (3) Class Balancing and Feature Selection (4). The pre-processing module consists of two phases. In the first phase of preprocessing, color normalization and contrast enhancement are done on the images so as to increase the quality of images. Later, in the second phase of preprocessing, for the extraction of texture features, gray scale conversion is performed whereas for the extraction of morphological features, K-Means clustering with K=3 is done where three clusters pink, purple and white are obtained.

In the next phase, features are extracted and combined to form a feature set. Two major features extracted are the texture and morphological features. Texture features such as Histogram, LBP, GLCM, Gabor, GLRLM, HOG is obtained from the colon images after the gray scale conversion after which they are unified to form a texture feature set. Three clusters obtained from the K-Means clustering are converted to its binary for extraction of Morphological. From each of the clusters, the connected components are chosen where each of the connected components has a minimum area T. The number of connected components in each of the clusters White, Pink and Purple are given C_w, C_p and C_r respectively. In each cluster nine morphological features such as area, perimeter, euler number, extent, orientation, eccentricity, convex area, major and minor axis length are found and their average is taken as the feature vector.

where u_i is the morphological features. The final morphological feature vector m is of length 27 containing feature extracted from white, pink and purple clusters.

Class imbalance is a predominant problem as there is a difference in the number of images in each class and affects the classification ability of the model. Synthetic Minority Over-sampling Technique (SMOTE)[15] is adopted so that the minority class samples are over-sampled to the sample numbers in the majority class leading to same number of images in each of the class. Once the class balancing is done, Attribute Selection is done as feature selection so as to select the most relevant features for the classification.

The combined feature vector after the class balancing and attribute selection, is taken for classification where it's classified into four classes namely normal, well, moderate and poor using 5 popular standard classifiers are used such as Naive Bayes, Random Forest, Support Vector Machine (SVM) with poly kernel and Multilayer Perceptron.

Data Statistics, Performance Evaluation Measures & Experimental Set up

The dataset consists of images at different magnifications 10X, 20X and 40X taken from 5-6μm thick tissue section colon biopsy samples which are stained with H&E taken from Aster Medcity, Kochi, India. For each of the magnifications, 70 Normal, 25 Well, 30 Moderate and 20 Poor images are available. Dr. Sarah Kuruvila and Dr. Shahin Hameed, the respective Senior consultant and Specialist, Department of Pathology, Aster Medcity, Kochi, India analyzed the H&E slides of colon biopsy and the dataset were prepared and ground truth label were given by them.

The classification capability of the proposed work is evaluated using the performance measures such as Accuracy, F-Score, Area under Curve (AUC) and Entropy Triangle. To evaluate the multi-class problems apart from the standard performance measures, Entropy triangle[16,17] is plotted. The classifier at the apex of the entropy triangle indicates good ones.

Results and Discussion

Proposed model was evaluated on Aster Medcity images of different magnifications with various classifiers in terms of the standard performance measures and thus contributing features are analyzed for each magnification. Further, the proposed system is compared with the existing models and other standard colon image datasets available.

Performance Measure Evaluation & Reduced Feature Space Analysis

When analyzing accuracy of the proposed model, Fig.2.1 (a) shows that Random Forest classifier performs well all magnifications with 84.84%, 94.27% and 86.19% respectively for 10X, 20X and 40X magnification respectively. However 20X gives highest accuracy for all the classifiers as 94.27% with Random Forest classifier followed by Perceptron and SVM classifier with 93.22% and finally Naive Bayes classifier with 83.85%. 40X magnification gives next highest accuracy followed by 10X for the Random Forest classifier. Fig.2.1 (b) gives the F-Score for different classifiers for the proposed model, where it's almost same as accuracy for all classifiers. Fig.2.1 (c) shows the AUC, where Random Forest classifier gives better result across all magnifications with 0.968, 0.99, 0.975 for 10X, 20X and 40X respectively. AUC also, 20X gave better result for all the classifiers in order of Random Forest, Perceptron, Naive and SVM. Then comes 40X and 10X magnifications for values of AUC. Thus, for the proposed model, 20X magnification is best suited with the Random Forest classifier.

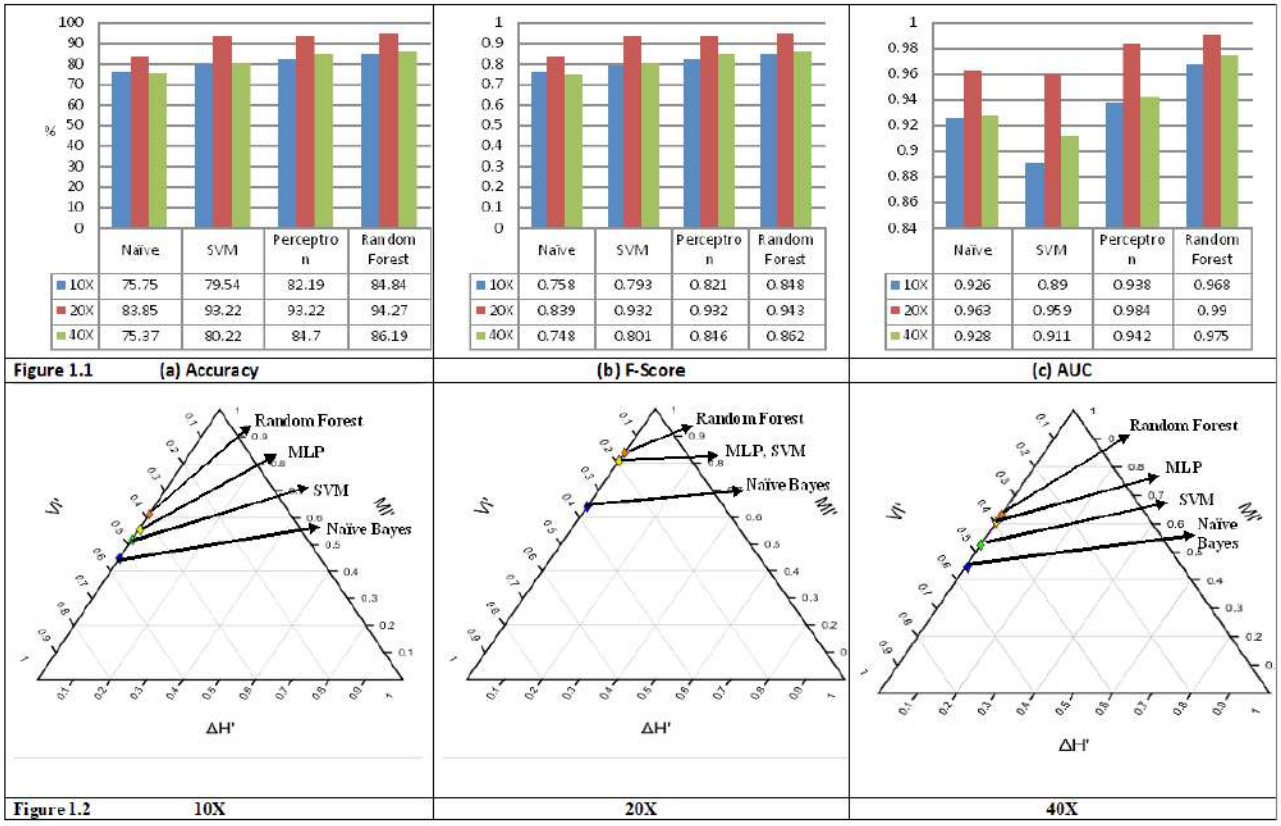

Figure 1.1: Performance Evaluation Measures on Proposed System with Magnifications (a) Accuracy (b) F-Score and (c) AUC. Figure1.2: Entropy Triangle for three magnifications

When analyzing the entropy triangle and the information theoretic measures, Random Forest is the best classifier across all magnifications. Multilayer Perceptron is second best for 10X and 40X as shown in Fig.2.2. Thus considering all evaluation measures, Random Forest is the best classifier for the proposed system followed by Multilayer Perceptron, SVM and Naive Bayes.

For each magnification, the relevant features selected for the classification after the Feature Selection may be different. The features selected from the Texture

and morphological features are given in Table.1. Out of 184 features from 20X magnification 42 is selected, whereas from 10X and 40X, 41 is selected. 37 features are selected out of 157 features for classification with 20X magnification, in which HOG, Histogram, GLRLM and LBP features contribute the more in the order as shown in Table.2. In all the three magnifications, after the attribute selection, Histogram, GLRLM and HOG texture features are more relevant for classification followed by LBP, Gabor and GLCM. Only for 20X magnification, GLCM feature is taken.

Table.3 shows the morphological features selected after attribute selection from each cluster, purple, pink and white. It's observed that most features in all magnifications are selected from the white cluster followed by pink and purple cluster. Out of the morphological features extracted eccentricity, extent, major axis length and minor axis length contribute more for classification.

The variation in the number of features selected for different magnifications may be due to image acquisition illumination condition as well as the staining difference. However white cluster contribute more for the morphological feature.

Table 1: Total Number of Features Selected After Attribute Selection

Magnification	Texture Feature	Morphological Feature	Total No. of Features Selected
10X	34	7	41
20X	37	5	42
40X	33	8	41

Table 2: Texture Features Selected After Attribute Selection

Magnification	GLCM (5)	LBP (59)	HOG (20)	Gabor (60)	Histogram (6)	GLRLM (7)
10X	0	10	7	13	2	2
20X	1	16	7	9	2	2
40X	0	6	14	11	1	1

Table 3: Clusters Selected from Morphological Features after Attribute Selection

Morphological Features	Cluster		
	10X	20X	40X
Area	Pink	----	----
Perimeter	----	----	White
Euler Number	----	----	----
Eccentricity	White	White	Purple, white
Convex Area	Pink	----	----
Extent	Purple, white	Pink, white	Pink, white

Cont... **Table 3: Clusters Selected from Morphological Features after Attribute Selection**

Orientation	Pink, white	----	----
Major Axis Length	----	White	White
Minor Axis Length	----	white	Purple, white
Total No. of Features Selected	7	5	8

Proposed Model Comparison with Existing models & Evaluation with other colon datasets

Multiclass categorization of colon images into four classes on different magnifications has not been experimented and hence comparison to direct similar work is not possible. However, the proposed system could be compared to almost similar works such as Stoean et. al[12], Rathore et. al[11] and Kather et. al[14] as shown in Table.4. These techniques are implemented in Matlab 2017b and performance measures are evaluated with Aster Medcity images of 10X magnification as these works were evaluated with this magnification. The proposed model is evaluated with Random Forest classifier. While comparing, the proposed system shows significant results when comparing all the measures such as accuracy, F-Score and AUC.

Table 4: Comparison of proposed method with existing models on 10X magnification

Technique	**Accuracy**	**F-Score**	**AUC**
Stoean et. al12	65.13	0.645	0.752
Rathore et. al11	51.74	0.498	0.722
Kather et. al14	75.64	0.744	0.850
Proposed Method	84.84	0.848	0.968

Table 5: Comparison of proposed method with other Colon Image Datasets

Dataset	**Magnification**	**Accuracy**	**F-Score**	**AUC**
Warwick QU 18	20X	87.71	0.871	0.974
Stoean et. al12	10X	98.00	0.98	0.999

The proposed model with the Random Forest is evaluated with other colon image datasets which are available in public such as Warwick QU dataset[18] and Stoean et. al.[12]. Table.5 shows the analysis of the proposed model with Random Forest classifier with other colon image datasets. For both datasets, the proposed model performed well in both magnifications. Thus, when analyzing the performance measures of proposed model with both datasets, the proposed model gives promising results for the multiclass classification.

Conclusions

In this work, classification of colon images into four classes such as normal, well, moderate and poor is done based on the minimal features comprising of texture and shape features. In order to address class balancing problem and feature reduction, SMOTE and Attribute Selection were applied respectively before classification. The model is evaluated on the Indian scenario colon images, acquired from Aster Medcity, Kochi, India at various magnifications. The proposed model performed

well for all magnifications of Aster data, however 20X is found to be better across others were an accuracy of 94.27% with the Random Forest classifier. Entropy triangle performance measure is used to address the multiclass classification problem apart from accuracy, F-Score, AUC in order to rank the classifier where Random Forest was best for the model. There are several possible future enhancements for the system. First, the model could be tested on large set of images. Second, some other structural features could be extracted from the region of interest and classified. Color features could also be extracted and tested on the system.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: My research article what we have written is completely self-depended which enrolls complete research depended on the prototype of each individual so it doesn't match any other research proposals/research persons.

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Effect of Scapular Position- Motion Maintenance Exercise Programme During Post Traumatic Shoulder Immobilization

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Abstract

Background: The scapula plays a key role in nearly every aspect of normal shoulder function. Alteration in scapular position and motion is found in association with most shoulder injuries. This alteration is term as scapular dyskinesis. Prevalence of scapular dyskinesis is about 67 to 100 %. But many literature focus on treatment after occurrence but very few aim at prevention during immobilization phase.This made indeed to study the effect of scapular position – motion maintenance programme during shoulder immobilization phase.

Objectives: To determine the effect of scapular position -motion maintenance exercise programme during post traumatic shoulder immobilization phase, To compare the effect of scapular position -motion maintenance exercise programme and conventional physiotherapy during post traumatic shoulder immobilization phase.

Method: A Total of 40 subjects were selected aged between 20 to 50 years. They were divided into two groups. Group A (experimental) and group B (conventional). Both groups received treatment for 6 weeks for a duration of 30 minutes. The outcome measure used wereVAS, Posture assessment, pectoralis minor muscle length ,Linnies test and scapular assistance test.

Result: The study concludes that experimental group (scapular position- motion programme)proved more efficacious in reducing risk of scapular dyskinesisin patients with humerus fracture during immobilization phase as compared with conventional treatment.

Keyword: *scapular dyskinesis, Immobilization phase, proximal humerus fracture, exercise therapy*

Introduction

Effective shoulder position, motion, stability, muscle performance and motor control are largely dependent on the scapular performance. Mechanically, the coordinated coupled motions between the scapula and humerus, is called scapula humeral rhythm.[1] Scapular Dyskinesis is found in association with various shoulder pathologies , although exact relationship between dyskinesis and clinical pathology is doubted.In case of nerve injury , fracture , Ac separation , muscle detachment , the injury results in dyskinesis, affecting shoulder function. In some cases like labral tear, rotator cuff disease , dyskinesis may be causative ,creating pathomechanics that predispose the arm to such injuries.[2]Humeral fractures accounts for approximately 7 to 8% of all adult fractures, further incidence has been reported to increase with age. Proximal humerus fractures being most common(50%) of all humerus fractures.[3]According to a study "Prevalance of scapular dyskinesis in patients with Distal radius fracture with or without shoulder pain" by Hector it was found that almost 80% of all patients with distal radius fracture showed scapular dyskinesis, with an increase in value 90.9% in group of patients with shoulder pain.[4] Scapular Motionsprovide optimal muscle length – tension ratios for accurate movement pattern, and promotes muscular energy conservation during arm motion. The most common causative mechanisms of scapular dyskinesis

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is soft tissue alterations i.e inflexibility or tightness of pectoarlis minor creating anterior tilt and protraction, glenohumeral internal rotational deficits, which creates a wind up of scapula on thorax leading to horizontal abduction.[5]

One of the most important abnormalities in abnormal scapular biomechanics is the loss of linking function in kinetic chain.[6] The scapula and shoulder are dependent links in kinetic chain. It helps transferring the forces from the large segments, the legs and trunk, to the smaller, rapidly moving small segments of the arm. If scapula becomes deficient in motion or position, transmission of the large generated forces from the lower extremity to upper extremity is impaired. This creates a situation of catch up in which more distal segments work at a higher level of activity for compensation of the loss of proximally generated forces. Calculations depicts that 20% decrease in kinetic energy delivered from hip and trunk to the arm necessitates an 80% increase in mass and 34% increase in rotational velocity at shoulder to deliver the same amount of resultant forces to hand .The kinetic chain is the most efficient system for developing energy and force.[7-8]

Scapular diskinesis causes weakness, tightness and muscle imbalance. most of the scapular motion and position can be treated by means of physical therapy relieving the symptom associated with in flexibility or trigger points, re-establishing muscle strength and activation patterns.[9] But many literature focus on treatment after occurrence but very few aim at prevention during immobilization phase. This made indeed to study the effect of scapular position – motion maintenance programme during shoulder immobilization phase which primarily focuses on linking function of kinetic chain.

Materials and Methodology

This experimental study was carried out with 40 subjects in Krishna Hospital Karad. A total of 40 subjects was divided equally into two groups by Simple random Sampling (Group A and Group B). Subjects were in immobilization phase with proximal humerus fracture. Both males and females between the age group of 20-50 years were included.

The Inclusion criteria in this study was Age group of 20 – 50 age,Both the genders and Patients with Proximal Humerus post reduction or post operative immobilization phase andExclusion criteriawas Neurological condition, Non cooperative patients, Patients with Fracture of scapula, Patients with External fixators, Patients with distal neurovascular deficit and Patients with rib and spinal fractures.

The Outcome measures was Pain assessment – VAS scale,Posture assessment, pectoralis minor muscle length and special test for Linnies test and scapular assistance test.

The materials used in the study was Plinth, Towel, Inch-tape, Swiss ball, Pressure biofeedback, Data collection sheet, Consent form.

Procedure

An approval for the Study was obtained from the Protocol committee and institutional Ethical committee of KIMSDU scapular dyskinesis.Subjects who fulfilled the inclusion and Exclusion Criteria was divided into two groups. Informed consent was taken from each of the subject prior to Participation. Instructions weregiven to the subjects about techniques performed. A total of 40 subjects were divided equally into two groups by Simple random Sampling (Group A and Group B). The subjects were divided into two groups according random allocation.

Pre-test:

Visual Analogue Scale (VAS) and Posture assessment, pectoralis minor muscle length and special test for Linnies test and scapular assistance test was used to assess the Subjects.

Group A

The treatment program was include:

First 3 week scapular stabilization exercise and next 3 week spinal stabilization exercise will be added with scapular stabilization exercise.

Group A(Experimental)[10-12]

Week 1

1. Posture training
- Scapular retraction exercise

2. Isometric exercise for scapular muscle
- .Shoulder Depression
- Shoulder Protraction
- Shoulder retraction

Week 2

Scapular stabilization exercise

1. Scapular clock exercise on a wall
2. T to Y to W exercise on swiss ball

Week 3

Scapular motion exercise (closed chain stabilization)

- Static close chain exercise (weight bearing)

Week 4

Spinal stabilization exercise was added with scapular stabilization

- **Pressure biofeedback in supine**
  - Lumbar flexion
  1. Multifidus facilitation
  2. Alternate single leg heel touch
  - Lumbar extension
  1. Oblique abdominal facilitation
  2. Alternate single leg heel touch
- **Lumbarmultifidus activation**
- **Transv. erseabdominis activation**
  - Abdominal hollowing: activation of transverses abdominis in crook-lying position.
  - Abdominal hollowing: activation of transverses abdominis in sitting.
  - Abdominal hollowing: activation of transverses abdominis in four point kneeling.
  - Activation of multifidus from sitting to lumbar neutral position

Week 5

Swiss ball exercise

- Sitting knee raise on swissball
- Abdominal slide
- Lying trunk curl with leg lift
- Wall slides

Week 6

1. pelvic floor exercise
- Pelvic bridging

2. diaphragmatic strengthening exercise
3. single leg standing on foam

Group B(control group)

- Rest
- Isometric exercise for scapular muscle(Shoulder Depression ,Shoulder Protraction ,Shoulder retraction), active exercise (daily for 6 weeks)

Post-test:

Visual Analogue Scale (VAS) and Posture assessment, pectoralis minor muscle length and special test for Linnies test and scapular assistance test was used to assess the Subjects.

Data Analysis

Between the group comparison

Table no 1: Baseline parameters comparison between both the groups (visual analog scale, Linnies test, pectoralis minor muscle length)

Group A & B						
Parameters			**post A**	**post B**	**t value**	**p value**
Visual analog scale			4.8±1.32	3.90±1.16	2.28	0.028
Linnies test	T2	RIGHT	8.32±0.94	8.42±1.61	0.23	0.81
		LEFT	9.1±1.93	10.22±2.67	1.25	0.21
	T4	RIGHT	9.22±0.52	9.27±0.75	0.79	0.8
		LEFT	9.21±0.80	9.82±1.51	0.24	0.12
	T7	RIGHT	10.8±1.24	9.57±2.57	1.95	0.05
		LEFT	10.52±1.77	9.42±2.64	1.54	0.13
Pectoralis minor muscle length		RIGHT	2.54±0.16	2.64±0.10	1.11	0.27
LEFT		2.58±0.15	2.64±0.10	1.38	0.17	

Table no 2: Baseline parameters comparison between both the groups (scapular abnormalities, scapular motion)

Group A & B			**POST A**	**POST B**
Scapular abnormalities	TILT	Present	6	13
		Absent	14	7
	WING	Present	2	6
		Absent	18	14
Scapular motion	Type 1		4	7
	Type 2		0	0
	Type 3		0	0
	Type 4		14	7
	Type 1,2		0	0
	Type 1,2,3		2	6
Scapular assistance test	Positive		14	7
	Negative		6	13

Discussion

The present study "Effect of scapular position - motion maintenance exercise programme during post traumatic shoulder immobilization phase" was conducted to see the effect of scapular stabilization and spinal stabilization exercise during immobilization phase in post traumatic shoulder. The scapula is anatomically and mechanically linked with shoulder function. Alteration in scapular position and motion is found in association with most shoulder injuries, termed as scapular dyskinesis. In a previous study "Prevalence of Scapular dyskinesis in patients withdistal radius fractures with or without shoulder pain" by Hector states that prevalence of Scapular Dyskinesis is shown in 80% of all patients with Distal Radius Fracture , with an increasing value of 90.9 % in patients with shoulder pain.The ratio was found to be 10 times greater in patients with Distal Radius Fracture accompanying with shoulder pain.[13]

A group of adult population with proximal humerus fracture treated conservatively with plaster cast or closed reduction were evaluated.In a similar study by AyhanEt. Al .stated following findings: Distal Radius Fracture had influence on scapular motion, exhibit altered scapular kinematics, increased posterior tilt , internal and upward rotation.[14-16]Further the study added to find the quality of motions at scapula if more proximal structures were affected. Another study by Edward Sheilds, "Scapular dyskinesis following displaced fractures of the middle clavicle"similar results were noted ,Scapular Dyskinesis is common after displaced middle third clavicle fractures.[17] In the present study we found a significant relation of scapular dyskinesis with proximal humerus fracture .Though there is no enough literature to support this evidence, but may studies approve findings of Scapular Dyskinesis occurrence after or with shoulder injuries. In a previous study by Mathew B."Prevalence of scapular dyskinesis in overhead and non overhead athletes" reported that Scapular Dyskinesisin overhead athletes (61%) was more compared to those with non overhead athletes(33%).[6]In a previous study by Poonam SS, "effect of desensitization methods during the early mobilization phase in post fracture conditions of upper extremity" reported that combination of desensitization along with the conventional physiotherapy was effective in decreasing pain, improving ROM and muscle strength than the conventional therapy alone.[18]Another study by Diksha U, "Effect of movement with mobilization in supraspinatus tendinitis" had noted that movement with mobilization, ultrasound, TENS and exercises are effective in management of supraspinatus tendinitis.[19]

The majority of studies included utilized visual observation of abnormal scapular rhythm to identify scapular dyskinesis. Two major abnormalities noted were scapular winging and scapular tilting. Scapular tilting was found in almost all subjects in Group A and Group B.Scapular winging was present in 8 subjects in Group A and 6 subjects in Group B.This interprets the fact not all patient with scapular tilting present with scapular winging. The mean pain values recorded using VAS showed a significant level of pain in both groups with pre values of 7 in Group A and 6.65 in Group B. There was a significant reduction in pain levels post treatment with 4.8 and 3.9 mean values respectively. The two main components scapular motion and scapular position were assessed using Kiblers classification and Linnes test respectively. According to Kiblersclassification it was found that majority of subjects belonged to Type I dyskinesis with 12 subjects(60%) in group A and 14 subjects(70%) in group B. This interprets that inferior angle positioning was severely affected .Group A was found to be more effective in correction of this fault by reduction of number from 12(60%) to 4(20%) as compared to Group B in which only 7 subjects(35%) showed corrections. Also subtype 3 and 4 that is medial border prominence and excessive superior border elevation was found to be noted though there rates were relatively less as compared to Type 1. Post treatment it was found that Group A had 14 Subjects (70%) showing T4 subtype that is symmetric and normal scapulae and group B had 7 subjects(35%) which showed thatcorrection of scapular motion rate was almost double in Group A proving efficacy of scapular positioning program.The second component that is linnies test added to the results of Kiblers classification by providing objective findings. The results of Linnies test showed significant results in group A. However group B showed not significant results. This measure although a subjective approach doesn't much count on the therapist findings rather the results are patient based .From the above gained results we can state that scapular position and motion programme is more effective in prevention of scapular dyskinesis.

Dyskinesis may be caused by multi factors such as bony causes, joint causes, neurological causes and soft tissues causes of alteration. Bony causes include thoracic kyphosis or clavicle fracture non-union or shortened mal-union. Joint causes include high grade acromioclavicularinstability, glenohumeral joint internal

derangement. Neurological causes include cervical radiculopathy, long thoracic or spinal accessory nerve palsy. Soft tissue mechanisms for scapular dyskinesis involve inflexibility or intrinsic muscle problems. The upper and lower trapezius force couple may be altered, with delayed onset of activation in the lower trapezius, which alters scapular upward rotation and posterior tilt. Altered scapular motion or position both decrease linear measures of the subacromial space, increase impingement symptoms, decrease rotator cuff strength, increase strain on the anterior glenohumeral ligaments and increase the risk of internal impingement. [1] The Mechanism contributing to scapular dyskinesis primarily include the following factors like Inadequate serratus anterior activation, excess upper trapezius activation, pectoralis minor tightness, posterior glenohumeral joint soft tissue tightness, thoracic kyphosis or flexed posture. This associated effects leads to lesser scapular upward rotation and posterior tilt, greater clavicular elevation, greater scapular medial rotation and anterior tlit, greater scapular anterior tilt, greater scapular medial rotation and anterior tilt, lesser scapular upward rotation.[13]

This study had some limitations but were majorly due to the small sample size. Further studies can be done on a larger sample size including more age groups. Also similar studies can be done taking into account some other fractures like distal humerus fractures, radius fractures, wrist fractures, elbow dislocation.

Conclusion

The study concludes that experimental group (scapular position- motion programme) proved more Efficacious in reducing risk of scapular dyskinesis patients with humerus fracture during immobilization phase as compared with conventional treatment.

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Hand Hygiene Practices and Training Gap in a Neonatal Intensive Care Unit at Coastal Karnataka India

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Abstract

Background: Non-adherence to hand hygiene practices is a well-known factor contributing to healthcare-associated infections in any healthcare setting. Mere knowledge of such practices doesn't guaran tee the compliance to the practices by healthcare personnel. In this study we explored the quantum of adherence to hand hygiene practices, the opportunity missed, the steps and the duration to be followed for hand hygiene practices and the training gap among the healthcare providers.

Methodology: A six-month cross-sectional study using a mixed-method approach of observations, interview and feedback mechanism is used to find the effectiveness of hand hygiene practices and any training gap to prevent healthcare-associated infections. Observations for two thousand opportunities for hand washing and written interview of 40 healthcare workers is carried out on hand hygiene practices at a neonatal intensive care unit of coastal Karnataka, India.

Results: The hand hygiene practices are as low as with nearly zero percent observed while with performing non-invasive activity like clearing an alarm at the bedside. There is a gap found in the duration of hand-washing practices, hand hygiene before and after any care activity is performed on the neonate. This gap resulted in the spread of healthcare-associated infections.

Conclusion: During the infections control training emphasis should also be given on the opportunities and hands on practices of hand hygiene.

Keywords: *Hand hygiene; Infection control; Healthcare-associated infections; Neonate; India*

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Introduction

Handwashing is the foundation for infection control practices[1]. Healthcare providers are trained and empowered to practice hand hygiene during their formal training. There can be a high rate of healthcare-associated infections if the perception and practice of hand hygiene are mismatched[2]. Performing hand hygiene

and compliant to complete hand hygiene practices are two different avenues. When all the five steps of hand hygiene are not performed in timely manner is considered ineffective and when all steps are completed with appropriate time duration hand hygiene is considered to be effective[1]. There can be instances when one may presumes completing optimum hand hygiene but it is not. We are exploring the gaps in training adherence to the steps needed to be followed, the opportunity missed for hand hygiene practice and maintaining stipulated time for each step by healthcare provider.

Materials & Method

In a neonatal intensive care unit (NICU) of a tertiary care teaching hospital situated at coastal Karnataka, India, a cross-sectional study was carried out for six months duration July 2017-Jan 2018. Hand washing and hand hygiene practices of all the healthcare workers were recorded for all the five moments and steps of handwashing as suggested by the world health organization. The questionnaire on five moments of hand hygiene was prepared; content and face validation were done. A sample size of 40 healthcare workers considering a 95% confidence level for a definite population N=44 with 5% confidence limit were selected for written interview based on their availability and consent for participation. The healthcare workers working in NICU responded on these questionnaires that include five physicians, 23 nurses, six paramedic trainee and six pediatric postgraduate trainees. Eighty observations at each opportunity for a total two thousand chances of performing hand hygiene were observed for these healthcare providers randomly on different time interval, preferably at non-peak hours using a checklist. The observations and questionnaire were related to WHO five moments of hand hygiene[1]. In each observation, if any step or opportunity was missed or partially completed, it was considered as non-compliance. Completion of activity as per the standard was considered as compliance with the practices. The data obtained was entered in Microsoft excel was analyzed further using R software version 3.1.1. The qualitative variables were summarized as number and percentage. The difference between the reported and observed practices is considered as a gap that needs to be focused on further training on hand-hygiene practices. Institutional ethic committee approval was taken with IEC approval number "MUEC/014/2016-17". Informed written consent for participation was obtained from all the participants before interviewing them.

Findings:

Two thousand observations and forty interviews on twenty-five variables were carried out for healthcare workers at NICU. There was a mismatch in the practices observed and knowledge of hand hygiene reported among healthcare workers. We categorized observations and responses under three subheadings; time duration, hand hygiene before an activity and hand-hygiene after an activity performed.

Time duration*:* Nearly 65% of healthcare workers reported that the ideal duration for handwashing with soap and water is <20 sec. However, only 12.5% healthcare workers practice handwashing with soap and water for >40 sec. 75% opportunities to carry out hand-washing practices were of less than 20-sec duration with soap and water. None of the healthcare workers reported the durations of hand hygiene using hand rub solution as 21 to 40 sec and we also observed the similar findings. Only one opportunity was recorded complying to 21-40 sec duration of hand hygiene using hand rub solution (Table 1).

Table 1: Showing time duration for hand hygiene practices by healthcare workers

Variables	Observations n=80	Reported n =40	The gap in reported vs observed*
	n (%)	n (%)	(%)
Duration of hand washing with soap and water			
05-20 sec	60 (75.0)	26 (65)	-10
21->40 Sec	20 (25)	14 (35)	-10
Duration of hand disinfection with hand rub solution (Min)			
05 - 10 Sec	62 (77.5%)	4 (10%)	-67.5
11- 20 Sec	17 (21.2%)	36(90%)	+68.8
21 - 40 Sec	1 (1.2%)	0 (0)	+1.2

* The gap is the percentage difference between reported and observation practices. A positive or negative gap of more than 20% is considered a significant gap in practice.

Hand hygiene before an activity: Reported compliance for hand hygiene before contacting neonate, handling or moving baby or applying a mask or giving massage was 57.5%, but observations showed more compliance than reported 83.8 % and 57.5% respectively. While performing non- invasive procedures or examination reported hand hygiene was always more than the observed. Considering any opportunity to perform hand hygiene during non-invasive procedure reported and observed was as low as 37.5% and 0% respectively. In case of performing hand hygiene before invasive procedure, reported and observed was always >80% (Table 2)

Table 2: Hand hygiene practice before any activity

Variables	**Observations n=80**	**Reported n =40**	**The gap in reported vs observed***
	n (%)	**n (%)**	**(%)**
Compliance for practice hand hygiene before having contact with neonate	53 (66.2)	23 (57.5)	-8.7
Clean hands before providing personal care activities: handling, moving, bath/sponge, feeding, changing linen, etc.	33 (41.2)	23 (57.5)	+16.3
Clean hands before delivering care and other non-invasive treatment: applying oxygen mask, giving a massage.	67 (83.8)	23 (57.5)	-26.3
Clean hands before Performing a physical non-invasive examination: Taking pulse, blood pressure, chest auscultation, recording ECG.	30 (37.5)	22 (55)	+17.5
Clean hands before Instilling eye drops, examining mouth, nose, ear with or without an instrument, inserting a suppository, suctioning mucous.	34 (42.5)	27 (67.5)	+25
Clean hands before Dressing a wound with or without an instrument, applying ointment On vesicle, making a percutaneous injection/ puncture.	76 (95)	32 (82.5)	-12.5
Clean hands before Inserting an invasive medical device	68 (85)	35 (87.5)	+2.5
Clean hands before Preparing food, medications, pharmaceutical products, sterile material.	80 (100)	25 (62.5)	-37.5

* The gap is the percentage difference between reported and observation practices. A positive or negative gap of more than 20% is considered a significant gap in practice.

Hand hygiene practices after an activity: Reported compliance towards hand hygiene practices post non-invasive procedure was nearly 50% whereas observed was as low as 2.5%. Hand hygiene compliance was reported less than 35% post touching any part of the neonatal environment and observed was nearly 0%. Compliance for hand hygiene was recorded better, >60% in post invasive procedure/ touching any mucosal part of neonate & the noted observations showed >95% compliance (Table 3).

Table 3: Hand hygiene practices after an activity

Variables	Observations n=80	Reported n =40	The gap in reported vs observed*
	n (%)	n (%)	(%)
Clean hands after the contact with a mucous membrane and with non-intact skin end.	78 (97.5)	28 (70)	-27.5
Clean hands after A percutaneous injection or puncture; after inserting an invasive medical device	80 (100)	34 (85)	-15
Clean hands after Removing an invasive medical device.	18 (22.5)	33(82.5)	+60
Clean hands after Removing any form of material offering protection (napkin, dressing, gauze, sanitary towel, etc.).	22 (27.5)	29 (72.5)	+45
Clean hands after handling a sample containing organic matter, after clearing excreta and any other body fluid, after cleaning any contaminated surface and soiled material (soiled bed linen, diaper etc.).	63 (78.8)	34 (85)	+6.2
Clean hands after providing personal care activities: handling, moving, bath/sponge, feeding, changing linen, etc.	44 (55)	20 (50)	-5
Clean hands after Delivering care and other non-invasive treatment: applying oxygen mask, giving a massage.	26 (32.5)	20 (50)	+17.5
Clean hands after Performing a physical non-invasive examination: Taking pulse, blood pressure, chest auscultation, recording ECG.	67 (83.8)	18 (45)	-38.8
Clean hands after an activity involving physical contact with the patients' immediate environment: changing linen, holding a side of the cradle, clearing sides of cradle.	2 (2.5)	20 (50)	+47.5
Clean hands after A care activity: adjusting perfusion speed, clearing a monitoring alarm.	0 (0)	11 (27.8)	+27.8
Clean hands after Other contacts with surfaces or inanimate objects: leaning against the cradle, leaning against a side table /ventilator.	0 (0)	14 (35)	+35
Practice hand hygiene after having contact with neonate?	53 (66)	24 (60)	-6
Practice hand hygiene after removing gloves?	26 (32.5)	29 (72.5)	+40
Wear gloves when hands may be contaminated with bodily fluid (e.g. Suctioning)	65 (81.2)	33 (82.5)	+1.3

* The gap is the percentage difference between reported and observation practices. A positive or negative gap of more than 20% is considered a significant gap in practice.

Discussion

No healthcare worker want any patient especially neonate to suffer from healthcare-associated infection because of any preventable cause. Maintaining good hand hygiene is vital for infection control practices, but mere awareness on how to perform handwashing is an incomplete effort to achieve a goal. The healthcare worker may be aware of the hand hygiene practices required to follow hence they reported at various instances the hand hygiene practices is required. However due to various reasons the practice is not followed and that can be captured through observations[3]. There are reports supporting our findings that there is a gap in the awareness and practices among healthcare workers for handwashing practices[4–6]. The very fact that even

the healthcare providers were not aware of performing hand hygiene post touching the neonatal environment or clearing the alarm provides scope to work further and improve on training programs. Any invasive procedure requires thorough handwashing using soap and water, whereas for non-invasive activities like clearing an alarm or changing linen etc., a hand rub disinfectant solution should be used.[7] Invasive activities do include any contact with bodily fluid during the procedure. Many training programs are carried for healthcare workers to optimize hand hygiene practice. There are limited training opportunities to learn when to perform hand hygiene practices[8]. Routinely in healthcare organizations professionals are also not made aware of the quantity of liquid soap solution or hand-rub solution required for appropriate hand hygiene. The study not only highlights the importance for the healthcare workers to learn and plan for training program on how to perform hand-washing but also when to perform which type of hand hygiene is equally important to prevent healthcare-associated infection. Studies have reported that a single classroom training approach may not work alone, rather a multimodal approach including role-play, video and game activities may show better results[9,10]hand hygiene compliance among health care workers (HCW). Whenever we are planning for handwashing campaign or training program, we need to prepare holistically to get optimum desired outcome. The healthcare workers also need to be clarified on the quantity of hand hygiene substance either soap or disinfectant solution along with clear demarcation on which practice to follow in which circumstances. As it was observed the healthcare workers were not clear whether to use hand rub solution or do handwashing or do both the practices. The significant importance of making the hand dry after any hand hygiene practice was missing that was captured during observations. The difference in reporting and observation practices gives insight to the training team about the focus area. If the gap is considerably high, as we considered a gap >20% as high, such instances need immediate special attention and training.

Conclusion

Training on handwashing must include sessions on when to perform hand hygiene how to perform, and the minimum duration required for optimum hand hygiene. Various identified opportunities should be enlisted in healthcare settings to minimize any mis-opportunity.

Conflict of Interest: All the authors declare of no conflict of interest.

Source of Funding: Self

Ethical Clearance: Institutional ethical clearance was obtained before the conduct of the study with number "MUEC/014/2016-17"

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A Study to Assess the Effectiveness of Protocol on Care of Newborn in Phototherapy on Knowledge and Practice among Nurses at Selected Hospitals in South India

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Abstract

Background: The present study assess the Effectiveness of Protocol on Care of Newborn in Phototherapy on Knowledge and Practice among Nurses at Selected Hospitals in South India

Method and Material: A pre - experimental one group pre and post test study design was used to collect all the necessary and relevant data from nurses. The study was conducted in the maternity ward and phototherapy unit of two hospitals. Based on inclusion criteria 50 nurses were selected and non probability convenient sampling techniques were used.

Results: In pre test level of knowledge of nurses regarding care of newborn in phototherapy, 17 (34%) had inadequate knowledge, 19 (38%) had moderately adequate knowledge and 14 (28%) had adequate knowledge. In post test majority of 44(88%) had adequate knowledge, 6 (12%) had moderately adequate knowledge and no one had inadequate knowledge. The improved mean value for knowledge was 10.43 with "t" value of 13.47 and improved mean value for practice was 6.78 with "t" value of 17.26. This results shows the high statistical significance at $p<0.001$.

Conclusion: The study concludes that there was a significantly improvement of knowledge and practicable in post test after administration of protocol. Thus protocol was observed to an effective tool to improve the knowledge and practice on care of newborn in phototherapy and it may be useful to implement future reference.

Keywords: *Protocol, Nurses, Newborn, Knowledge, Practice, Hospital and south India.*

Introduction

Newborns are considered to be tiny and powerless beings, completely dependent on others for their adaptation in the external environment. Within one minute of birth the normal newborn adapts from the dependent fetal existence to an independent being capable of carrying on the physiological processes. This transition, in many babies takes place in a smooth, uneventful way.

In controversy to the above, a few newborns face some minor disorders. During the process of physiological adaptation for its survival, the neonate has to face many life threatening problems, such as asphyxia, hypothermia, hyperbilirubinemia, infections etc.

One of the most important minor disorder that occur in the newborn during the transition phase is hyperbilirubinemia. It is the yellow discoloration seen

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in the skin and sclera due to an increase in the serum bilirubin level. Excess amount of bilirubin in the blood that causes hyperbilirubinemia. **(Halliday, H. L. 1989)**

Globally, 65% of the newborns develop hyperbilirubinemia making it one of the most common problems in the majority of the newborn.(**William,W. Hay,. 2009).**In India approximately 4 million babies are born every year. Of them, 60 to 70% of the newborns develop hyperbilirubinemia. These statistics indicate that hyperbilirubinemia is a very common condition.

Stokowski, L. A.[3] (2006) said that proper nursing care enhances the effectiveness of phototherapy and minimizes complications. Nursing responsibilities include ensuring effective irradiance delivery, minimizing skin exposure, providing eye protection and eye care, carefully monitoring thermoregulation, maintaining adequate hydration, promoting elimination and supporting parent-new born interaction.

Nurses play a vital role in providing comprehensive care for neonates on phototherapy based on their needs. Meticulous and appropriate nursing care during phototherapy is the best way to prevent the complications.

Newman & Esterling[4] (2000) stated that according to the British Columbia Reproductive Care Program of Neonates, hyperbilirubinemia is a common neonatal problem especially during the 1st week of life when approximately 50 percent of all newborns have visible jaundice, of them 8-20 percent of term neonates exceed the total serum bilirubin values of 13 mg/dl, and need phototherapy.

All the above studies tell about the various complications that occur due to phototherapy, and stress that prevention can be possible with good care of the newborn. Neonates need close monitoring and careful nursing measures to improve their health status and to prevent complication.

During this time nurses play a very vital role in preventing complications and maintaining the well being of the newborn. With growing technology in the health sciences and increasing specialization of the Nursing profession, more rigorous control is required to ensure that nurses should possess sound scientific knowledge and skills to deliver safe and quality care.

Asha P. Shetty [5] (2003) conducted an experimental study, to assess the effect of photo therapy among full term newborn with a view to develop a nursing care protocol. The study concluded that, most often newborns with hyperbilirubinemia are treated with phototherapy which was effective. It was noted that development of a valid protocol for care of newborns in phototherapy would help practicing nurses to act promptly and independently.

Many studies in this area have been conducted in the western countries and protocols have been developed. But in India the investigator has observed that there is no specific protocol used by nurses while caring for babies in phototherapy. Hence the care provided was observed to be inadequate and many complications arose for the newborns. Having this in mind the investigator took up the responsibility of preparing a protocol to be followed while providing care for babies in phototherapy and also decided to test the effectiveness of the protocol through a pre- experimental study. The investigator tries to focus the effectiveness of the protocol which is cheap and resourceful intervention to care for the newborn during phototherapy and to assess the knowledge and practice among nurses for the same.

Method and Material

The study was designed to assess the the effectiveness of protocol on care of newborn in phototherapy on knowledge and practice among nurses at selected hospitals, Madurai. Investigator obtained formal permission from the administrative officer of Kasthuriba hospital and from the medical director of Leonard hospital, Madurai prior to the initiation of the study

Study Design: A quantitative research approach includes the research design in this study was pre experimental one group Pretest – Post test study design was considered to be the most appropriate to achieve the set of objectives in this study. The objectives were to assess the pre & post test level of knowledge and practice of nurses regarding care of newborn in photo therapy. To compare the pre and post test level of knowledge and practice of nurses regarding care of newborn in photo therapy. To correlate the mean improvement level of knowledge and practice among nurses regarding care of newborn in phototherapy. To associate the mean improvement knowledge and practice scores on care of newborn in phototherapy with selected demographic variables. The study was conducted in maternity ward and photo therapy units of two hospitals viz...

Kasthuriba hospital and Leonard hospital, Madurai. Kasthuriba hospital is a 200 bedded hospital which has well established maternity ward and photo therapy unit. Totally 35 - 40 newborns were admitted per month for the treatment of hyperbilirubinemia. Leonard hospital is a 250 bedded hospital.The phototherapy unit has 15 phototherapy machines in which 25-30 newborns were admitted per month for the treatment of hyperbilirubinemia. Totally 25 nurses are employed, all of them are posted in the maternity ward and phototherapy unit in a rotation.

Study Population: Fifty nurses who are qualified and working in maternity ward and phototherapy unit were included in this study

I**nclusion Criteria:** The nurses were working in photo therapy units and maternity wards and nurses were qualified as Diploma, B.Sc (N) Postbasic and B.Sc Basic (N).

Description of the Tool: A non probability convenience sampling technique was used in this study. The tool of the study has three section. **Section A:** The demographic variables which includes age, gender, professional education, year of experience in service, total year of experience in phototherapy unit and source of information.

Section B:A structured knowledge questionnaire, it's consists of 30 multiple choice questions with 4 options and a single correct answer. Correct answer carries 1 mark and wrong answer carries-0 mark.The Questions covered the following aspects -Knowledge about hyperbilirubinemia–13, Knowledge about phototherapy – 7 and Care of newborn in phototherapy - 10.

The knowledge and practices score range as follows

Range	Score
> 75 %	Adequate knowledge
50 – 75 %	Moderately adequate knowledge
< 50 %	Inadequate knowledge

Section C : The observation check list has 25 items. The items were in the 'Yes' or 'No' form. The score for yes is 'one' and No 'Zero'.

Content Validity and Reliability of the Tool

Content validity of the tool and protocol was got from three nursing experts in the field of obstetrics and gynecological nursing and two medical (DGO) experts. The reliability of the tool was established by using test-retest method to assess the reliability for knowledge with the same samples at different timings. The reliability score r = 0.9. To assess the reliability for the observational check-list, inter -rater method was used. The r value was 0.87. It indicated highly positive correlation.

Data Collection Procedure: The formal permission was obtained from the administrative officer and from the medical director of hospital, Madurai. The data for the study was collected with in the period of 4 weeks. During data collection period the investigator worked from 8 am to 4 pm for 5 days a week. The investigator covered 3-4 nurses per day. After getting their oral consent the investigator collected the pre test data using structured questionnaire to assess the knowledge and observational check list for assessing the practice. Each nurse took 30 – 40 minutes to answer all the questions. The investigator spent 25-30 minutes for assessing the nurses' practice on care of newborn in phototherapy. After the completion of the pre test data collection, the protocol on care of newborn in phototherapy was administered to the nurses. After 7 days post test was conducted by using the same structured questionnaire and observational check list for the same samples. The data obtained were analyzed using both descriptive and inferential statistics.

Findings

The findings from the study are tabulated, analyzed and interpreted below. In relation to demographic variables, the majority of 14 (28%) were in the age group of more than 31 years, 40 (80%) were females, 28 (56%) had completed GNM.

Table 1 : Frequency and percentage distribution of the Pre test & Post test level of knowledge of nurses regarding care of newborn in phototherapy.

N=50

VARIABLES	Pre Test						Post Test					
	Inadequate (< 50%)		Moderately Adequate (50 – 75%)		Adequate (> 75 %)		Inadequate (< 50%)		Moderately Adequate (50 – 75%)		Adequate (> 75 %)	
	NO	%	NO	%	No	%	NO	%	NO	%	NO	%
Knowledge about hyperbilirubinemia	16	32	25	50	9	18	-	-	-	-	50	100
Knowledge about phototherapy.	19	38	26	52	5	10	-	-	6	12	44	88
Care of Newborn in phototherapy	13	26	19	38	18	36	-	-	-	-	50	100

Table 2: Frequency and percentage distribution of the Pre & Post test level of practice of nurses regarding care of newborn in phototherapy. **N-50**

PRACTICE VARIABLES	Inadequate (< 50%)		Moderately Adequate (50 – 75%)		Adequate (> 75 %)	
	NO	%	NO	%	NO	%
Pre test	2	4	38	76	10	20
Post test	-	-	6	12	44	88

Table 3 : Comparison of pre test and post test level of Knowledge and practice among nurses regarding care of newborn in phototherapy. **N= 50**

Variables	Knowledge			Practice		
	Mean	SD	't' value	Mean	SD	't' value
Pre test	17.78	6.67	13.47 ***	16.24	2.55	17.26 ***
Post test	28.12	2.88		23.02	2.48	

*** P < 0.001

Table 4 : Correlation between the overall mean improvement level of knowledge and practice of nurses regarding care of newborn in phototherapy.

N = 50

	POST TEST		
VARIABLES	**Mean**	**S.D**	**' r' Value**
Knowledge	28.12	2.88	0.813 ***
Practice	23.02	2.48	

*** P < 0.001

With regard to level of knowledge the post test mean score was 28.12 and S.D was 2.88. With regard to level of practice, the mean was 23.02 and S.D. was 2.48 .The calculated 'r' value was 0.813 which show that there was a positive correlation between the overall mean improvement level of knowledge and practice at a statistically significant level of p < 0.001.

The present study supported by Milly **Mathew (2003)** on the topic can the self instructional module improves the nurse's knowledge on neonatal hyperbilirubinemia. The findings revealed that the self instructional module was effective in increasing the knowledge level of nursing personal with a t value of t=15.68 at p<0.5 level. The correlation r value between the knowledge and practice was r=0.93 which showed a good positive correlation.

Discussion

The present study was done to assess the effectiveness of protocol on care of newborn in phototherapy on knowledge and practice among nurses at selected hospitals, Madurai. The implementation of protocol was effective intervention during phototherapy on the nurses and the overall health profession. Data were analyzed from 50 nurses. The overall pre test mean score was 16.24 with S.D was 2.55 and the post test mean was 23.02 with S.D was 2.48 and the calculated 't' value was 17.26 which had statistically high significance at P < 0.001 level. The protocol was found to be effective in improving the practice of nurses regarding phototherapy

Regarding association of mean improvement level of knowledge of nurses regarding care of newborn in phototherapy with selected demographic variables of source of information at p<0.05. The other demographic variables have no significant association with the knowledge of nurses. Regarding practice the results revealed that there was no statistically significant association of the mean improvement level of practice with the selected demographic variables.

Conclusion

The present study was conducted to assess the effectiveness of protocol on knowledge and practice regarding care of newborn in photo therapy among nurses in maternity ward and photo therapy unit of Kasthuriba and Leonard hospitals at Madurai, 2009. From the results of the study it was concluded that protocol on care of newborn is an effective method to improve the knowledge and practice level of nurses. The findings revealed that the nurses, who had good knowledge about care of newborn in photo therapy, will have good practice too.

Implications:

Nursing Practice:

Nurses working in maternity ward and photo therapy unit should have adequate knowledge and practice about care of newborn in photo therapy . The nurses should update their knowledge by in service education and continue nursing education programs. Nurses who have good knowledge and practice regarding care of newborn in photo therapy will be able to promote the newborns health and thereby reduce the neonatal morbidity and mortality.

Nursing Administration:

The administrator has important role in creating awareness to increase the knowledge about care of newborn in photo therapy. In order to develop professional knowledge she has to make arrangements to conduct regular in-service education and continue nursing education programs on care of newborn in photo therapy.

Nursing Education:

The nursing curriculum should be strengthened to enable nurses to excel in knowledge and practice of care of newborn in photo therapy. Students should be encouraged to have hands on experience in photo therapy units. Monitoring and assessing the newborn condition during photo therapy should be included as a clinical procedure.

Nursing Research:

The findings of study can be disseminated to clinical nurses and student nurses through web site, literature, journals etc. The findings of the study will help the professional nurses and nursing students to improve their knowledge and practice

Recommendations:

− The protocol can be placed in the maternity and phototherapy units for the nurses to read and follow.

− A similar study can be conducted by increasing the samples size in different setting for better generalization.

− A comparative study can be done at various setting.

− A comparative study can be done on knowledge and practice between diploma nurses and B.Sc nurses.

Limitation:

- The investigator faced difficulty in seeking permission in selected hospitals.

- The investigator faced ample difficulty in collecting related literature as there was an only limited study on knowledge and practice among nurses.

Ethical Clearance- Taken from institutional ethical committee faculty members

Source of Funding- Self funding

Conflict of Interest – Nil

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Analysis of Dermatoglyphic Pattern in Potentially Malignant Disorder and Oral Carcinoma Patients

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Abstract

Aim: To assess the association between dermatoglyphic pattern and potentially malignant disorders and oral squamous cell carcinoma patients which might help in predicting the occurrence of these two disorders.

Background: Dermatoglyphics are the dermal ridge configuration on the digits, palms and soles. They are genetically determined and influenced by environmental forces that are operating before birth. Several studies have shown association between dermatoglyphics and different types of cancer. Hence this study was undertaken to determine whether specific dermatoglyphic patterns exists which help in predicting the occurrence of oral squamous cell carcinoma (OSCC) and oral potentially malignant disorders.

Materials and Method: After explaining about the study to the subjects, an informed consent will be obtained. A detailed history with thorough clinical examination will be done and findings will be recorded . The clinically diagnosed cases of potentially malignant disorders and oral squamous cell carcinoma will be confirmed histopathologically and will be included in the study. Finger and palm prints will be collected using ink method from 10 subjects with oral squamous cell carcinoma, 15 subjects with potentially malignant disorders and 25 healthy controls and will be evaluated qualitatively and quantitatively.

Results: Arches and loops were more frequent in cases than in controls whereas whorls were more frequent in control group. 80% of the patients with potentially malignant disorders have loop pattern, 40% of the patients has arches and 30% have whorls. 50% of the patients with oral squamous cell carcinoma have loop pattern, 30% have arch pattern and 20% have whorl pattern. 68% of the control group have whorl pattern, 20% have arch pattern and 12% have loop pattern.

Conclusion: This study concluded that dermatoglyphic patterns may have a role in identifying individuals either with or at risk for developing potentially malignant disorders like leukoplakia, oral submucous fibrosis , lichen planus etc and oral squamous cell carcinoma . Hence it can be used to identify high risk group, so that early primary and secondary preventive measures can be instituted in order to prevent the occurrence of these lesions.

Keywords: *Potentially malignant disorders, oral squamous cell carcinoma, dermatoglyphics, arches, loops, whorls.*

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Introduction

Since the early days of civilization, the features of the hands have fascinated scholars, doctors, and laymen alike. Through decades of scientific research, the hand has come to be recognized as a powerful tool in the diagnosis of psychological, medical, and genetic conditions. Cummins in 1926 first introduced the term “dermatoglyphics” which refers to the study of the

naturally occurring patterns of the surface of the hands and feet[1].Dermatoglyphics is a relatively new science, which involves the study of fine patterned dermal ridges on digits, palms and soles. Cummins and Midlo (1926) coined the term dermatoglyphics (derma = skin; glyphics = carvings), for the scientific study of ridges as well as the ridges themselves [2]. Since then, this approach has been used in various scientific studies to establish relationship of fingerprints as genetic and/or chronic health markers. Dermatoglyphic patterns are genetically determined and remain unchanged from birth to death. Dermatoglyphics is considered as a window of congenital and intrauterine abnormalities. At present, several researches claim this study of dermatoglyphics as an important diagnostic tool for some diseases especially the diseases with obscure etiology and mysterious pathogenesis [3]. Widespread interest in epidermal ridges developed only in the last several decades when it became apparent that many patients with chromosomal aberrations had unusual ridge formations. Unusual ridge configurations have been shown to exist not only in patients with chromosomal defects but also in patients with single gene disorders and in some in whom the genetic basis of the disorder is unclear [4]. In dentistry, dermatoglyphics have been studied to help predict disorders like cleft lip and cleft palate, dental caries, malocclusion, congenital anomalies like ectodermal dysplasia, gingival fibromatosis, periodontitis, bruxism etc [5]. Since epidermal ridge patterns form early in fetal development and remain unchanged throughout life [6,7] unusual dermatoglyphics may indicate gene or chromosomal abnormalities consistent with diseases such as oral leukoplakia, oral submucous fibrosis and oral squamous cell carcinoma. Potentially malignant disorders, conveys that not all lesions and conditions may transform to cancer, some may have an increased potential for malignant transformation. These disorders of the oral mucosa are also indicators of risk of likely future malignancies elsewhere in the oral mucosa and not only site specific predictors [8].This study was undertaken to study dermatoglyphic patterns in individuals with potentially malignant disorders and oral squamous cell carcinoma, so that individuals with habits and similar patterns can be identified at the earliest and preventive measures can be instituted in these susceptible individuals to prevent the occurrence of potentially malignant disorders and oral squamous cell carcinoma.

Materials and method: After explaining about the study to the subjects, an informed consent will be obtained. A detailed history with thorough clinical examination will be done and findings will be recorded . The clinically diagnosed cases of potentially malignant disorders and oral squamous cell carcinoma will be confirmed histopathologically and will be included in the study. Finger and palm prints will be collected using ink method from 10 subjects with oral squamous cell carcinoma, 15 subjects with potentially malignant disorders and 25 healthy controls and will be evaluated qualitatively and quantitatively.

Fig 1: Patient with oral submucous fibrosis.

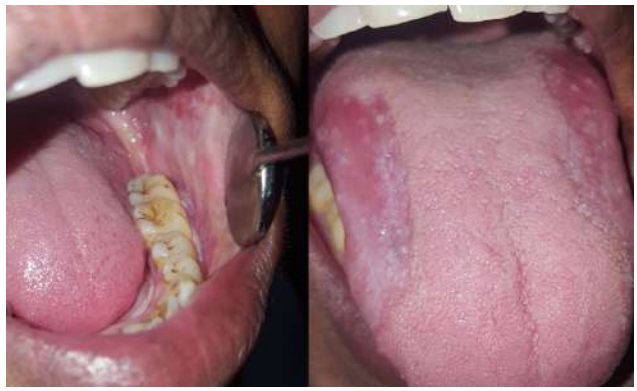

Fig 2: Patient with leukoplakia

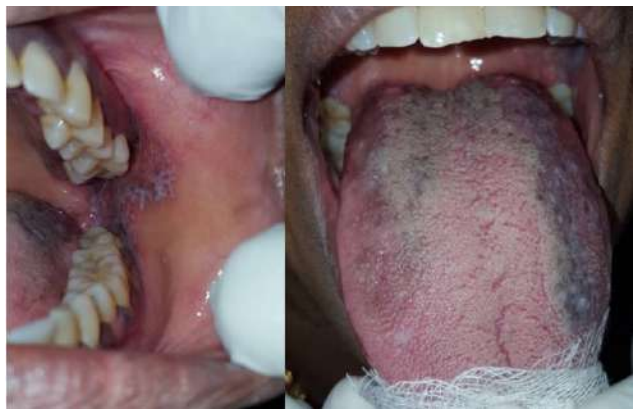

Fig 3: Patient with lichen planus

Fig 4: Shows different dermatoglyphic pattern

Results

Arches and loops were more frequent in cases than in controls whereas whorls were more frequent in control group.

Table 1: Fingerprint pattern in patients with potentially malignant disorders

Pattern	Potentially Malignant Disorders
Arches	40%
Loops	80%
Whorls	30%

The above table shows distribution of various finger print patterns in patients with potentially malignant disorders. 80% of the patients with potentially malignant disorders have loop pattern, 40% of the patients has arches and 30% have whorls.

Table 2: Fingerprint pattern in patients with oral squamous cell carcinoma

Pattern	Oral Squamous Cell Carcinoma
Arches	30%
Loops	50%
Whorls	20%

The above table shows distribution of various finger print patterns in patients with oral squamous cell carcinoma.50% of the patients with oral squamous cell carcinoma have loop pattern, 30% have arch pattern and 20% have whorl pattern.

Table 3:Fingerprint pattern in control group

PATTERN	CONTROL GROUP
Arches	20%
Loops	12%
Whorls	68%

The above table shows distribution of various finger print patterns in control group.68% of the control group have whorl pattern, 20% have arch pattern and 12% have loop pattern.

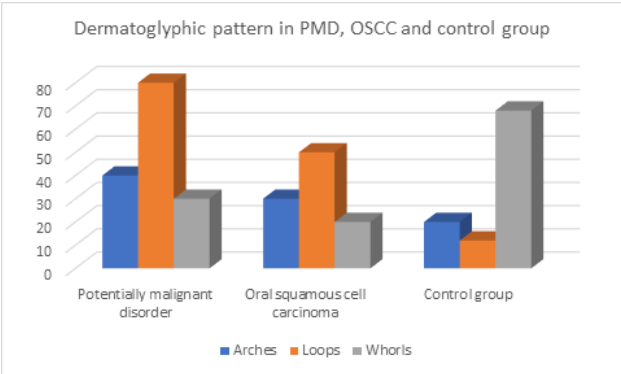

Fig 5: Graph showing different fingerprint pattern in potentially malignant disorder patients, oral squamous cell carcinoma patients and control group

Discussion

Dermatoglyphics refers to epidermal ridges present on the palm, sole, fingers, and toes. These epidermal ridges are formed in the same intrauterine period when neuronal development takes place in the intrauterine life of a fetus. Thus, dermatoglyphics is correlated with genetic abnormalities and is useful in the diagnosis of congenital malformations and many other medical disorders. Since then widespread interest in epidermal ridges developed in medical field since it became apparent that many patients with chromosomal aberrations had unusual ridge formations. Inspection of skin ridges, therefore seemed promising, simple, inexpensive means for determining whether a given patient had a particular chromosomal defect [9]. SCC is a widespread disease associated with considerable amount of morbidity and mortality. It is a major worldwide health problem and the number of sufferers is increasing rapidly due to more and more people embracing deleterious habits such as tobacco chewing, smoking and alcohol abuse. Similarly OSF is a widespread precancerous condition especially prevalent in South East Asia. Areca nut is an important predisposing factor, but not all the patients with chronic habits suffer from the disease. Conversely, not all the patients with OSF have a prolonged history of areca nut or tobacco consumption. It is said that genetic susceptibility is responsible for such variations.

Tobacco and alcohol are established risk factors for oral leukoplakia, oral submucous fibrosis and Oral squamous cell carcinoma, substantial evidence also suggest that the carcinogenic process is driven by the interaction between exposure to exogenous carcinogens and inherent genetic susceptibility. In response to environmental exposures, genetic damage accumulates more quickly in individuals with genetic susceptibility to DNA damage than in those without such instability but with a similar exposure. Consequently, individuals with genetic instability might be at a greater risk for developing these lesions [10].

In this study Arches and loops were more frequent in cases than in controls whereas whorls were more frequent in control group. Atasu et al, in examining dermatoglyphics and cancer patients in general, one of the studies has noted an increase in whorls and a decrease in radial loops in 201 Turkish cancer patients[8] which was contradictory to this study. Kindred et al, found that ,with different cancers found more whorls to be present and in studying high risk found more whorls[11]. Yet another study found an increased proportion of ulnar loops in cancer patients.

The dermal ridges have various notable characteristics which make them important, not only in personal identification, but also in human biology for various reasons. Firstly, unlike many bodily traits the dermal ridges and configuration once formed remain unchanged except in dimensions, i.e. they are age stable. The ridges are environment stable and begin to appear from 5th month of embryonic life. Although the patterns formed by ridges vary in size, shape and detailed structures, still they can be classified into definite main types. The dermatoglyphic features can thus be exploited quantitatively and qualitatively to be used as "genetic marker" of a disorder.

Considering the high mortality and high morbidity rate due to oral cancer in India, we planned to assess palmar dermatoglyphics in potentially malignant disorders and OSCC and find whether a correlation exists between potentially malignant disorders, oral squamous cell carcinoma and palmar dermatoglyphics. Our study revealed differences in the dermatoglyphic patterns among various groups which could be considered genetic markers for detecting those who are predisposed to develop potentially malignant disorders and oral squamous cell carcinoma.Hardly any dermatoglyphic study has been carried out in relation to oral malignancy, hence more studies with larger sample need to be undertaken to conclude the results.

Conclusion

Arches and loops were more frequent in cases than in controls whereas whorls were more frequent in control group.This study concluded that dermatoglyphic patterns may have a role in identifying individuals either with or at risk for developing potentially malignant disorders like leukoplakia, oral submucous fibrosis , lichen planus etc and oral squamous cell carcinoma . Hence it can be used to identify high risk group, so that early primary and secondary preventive measures can be instituted in order to prevent the occurrence of these lesions.

Ethical Clearance – Taken from Instituitional Ethical Committee

Source of Funding- Self

Conflict of Interest- Nil

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Evaluation of Safety and Efficay of Nifedipine in Pregnancy Induced Hypertension: A Prospective Observational Study

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Abstract

Introduction: Pregnancy induced hypertension (PIH) is a pregnancy specific, multisystem disorder characterized by development of edema, hypertension and proteinuria after 20 weeks of gestation. The group of diseases includes preeclampsia and eclampsia, which are peculiar to pregnancy. Antihypertensive treatment should be commenced in all women with a systolic blood pressure ≥170 mm Hg or a diastolic blood pressure ≥110 mm Hg because of the risk of intracerebral hemorrhage and eclampsia.

Aim: To evaluate the safety and efficacy of nifedipine in gestational hypertension.

Methodology: A Prospective observational study was conducted in outpatient and inpatient department of obstetrics and gynaecology of Government hospital for a period of one year (November 2017 - November 2018).Inclusion criterion of the study was to collect and analyse the case sheets of patients having Gestational hypertension and Gestational age of >20 weeks admitted in the hospital and visited outpatient department during one year duration. Exclusion criterion of this study was patients having chronic hypertension, Gestational age of <20 weeks, Patients who were diagnosed with other causes of convulsions in pregnancy like cerebral malaria and epilepsy and Patients not willing to participate in the study.

Results and Discussion: In the present study, 70(68.62%) patients were treated with nifedipine and rest 32(31.37%) patients were treated with other antihypertensive. Nifedipine showed significantly better clinical outcomes in comparison to other anti hypertensive. Nifedipine safety profile in terms of adverse effects was significantly better than other anti hypertensive. IUGR had greater relative risk compared to other fetal outcomes while relative risk was significantly less for maternal outcomes in patients treated with nifedipine.

Conclusion: Our study results implicated the efficacy of nifedipine in pregnancy induced hypertension in terms of clinical outcomes, type of delivery, maternal outcomes and fetal outcomes and incidence of adverse effects.

Key words: *Pregnancy induced hypertension, Preeclampsia, Anti hypertensive, Nifedipine.*

Introduction

Pregnancy induced hypertension (PIH) is a pregnancy specific, multisystem disorder characterized by development of edema, hypertension and proteinuria after 20 weeks of gestation [1]. The group of diseases includes preeclampsia and eclampsia, which are peculiar to pregnancy [2].Hypertension in pregnancy is defined as systolic blood pressure greater than or equal to 140 mmHg and/or diastolic blood pressure greater than or equal to 90 mmHg. Severe hypertension in pregnancy is defined as a systolic blood pressure greater than or equal to 170 mmHg and/or diastolic blood pressure greater than or equal to 110 mmHg [3].Hypertensive disorders in pregnancy include Gestational hypertension, Preeclampsia – eclampsia, chronic hypertension–

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essential, secondary and white coat. Risk Factors for Preeclampsia - Moderate risk: Age 40 years or more, first pregnancy, Multiple pregnancy, Interval since last pregnancy of more than 10 years, Body mass index of 35 or more at presentation, Family history of pre-eclampsia, Nulliparity, Multifetal gestation, Obesity, Preeclampsia in a previous pregnancy and Abnormal uterine doppler studies at 18 and 24 weeks [4]and High risk: Chronic hypertension, Chronic kidney disease, Hypertensive disease during a previous pregnancy, Autoimmune disease, Pregestational diabetes mellitus and Presence of thrombophilia[4].Antihypertensive treatment should be commenced in all women with a systolic blood pressure ≥170 mm Hg or a diastolic blood pressure ≥110 mm Hg because of the risk of intracerebral hemorrhage and eclampsia. Severe hypertension can be treated using drugs like Nifedipine which is administered as a 10mg oral dose initially, with a repeat dose of 10mg if there is inadequate response after 30 minutes. Intravenous labetalol: This is administered as a 20-50 mg bolus dose over 2 minutes. Hydralazine: It is 3rd agent of choice administered as an IV or IM dose of 5-10 mg every 20-30 min to control hypertension of ≥170 systolic and/or 110 diastolic. Ongoing Treatment for Hypertension: In terms of lowering blood pressure in preeclampsia, a number of drugs have demonstrated safety and efficacy [5].Antihypertensive treatment duration depends on clinical symptoms and patients response to therapy [6]. Medication adherence is essential to prevent PIH related complications [7]. First line drugs include methyldopa and labetalol. Second line agents are Hydralazine, Nifedipine and prazosin. Nifedipine prevents calcium from entering cells of the heart and blood vessel walls, resulting in lower blood pressure [8]. Angiotensin converting enzyme (ACE) inhibitors and angiotensin receptor blockers are contraindicated in pregnancy. Their use in the third trimester has been associated with fetal death and neonatal renal failure. Drug of choice for the prevention of eclampsia is $MgSo_4$. Magnesium sulphate therapy is recommended for use antepartum, intrapartum and within the first 24 hours postpartum for severe pre-eclampsia. Need of the Study: Every year nearly 5, 29,000 women die globally due to pregnancy related causes. For each death nearly 118 women suffer from life threatening events or severe acute morbidity. Hypertensive disorders of pregnancy seem to be one of the major causes of maternal morbidity and mortality leading to 10-15% of maternal deaths specially in developing world [2]. World Health Organization (WHO) estimates that at least one woman dies every seven minutes from complications of hypertensive disorders of pregnancy. With efficient antenatal care and early treatment of pregnancy induced hypertensive disorders, the serious form i.e. eclampsia has become almost a clinical rarity in developed countries. However, in developing country like India and in the rural population, it still continues to be a major obstetric problem. Moreover the disease not only affects pregnancy outcome but also predisposes mother and child to long term health complications like cardiovascular diseases [8].This study attempts to look how these complications can be minimised/managed. Also this study helps to know the prevalence of pregnancy induced hypertension and its complications.

Methodology

A Prospective observational study was conducted in outpatient and inpatient department of obstetrics and gynaecology of Government hospital for a period of one year (November 2017- November 2018), which provides specialized healthcare services to people. Before initiation of the study, approval was obtained from Institutional Human Ethical Committee of the hospital. Main aim is to study the management of gestational hypertension. Objectives of the study include comparing different antihypertensive drugs given in the gestational hypertension patients, identify and assess the impact of various factors that influence maternal morbidity and mortality, determining type of delivery and to determine different maternal and fetal outcomes associated with the gestational hypertension. Inclusion criterion of the study was to collect and analyse the case sheets of patients having Gestational hypertension and Gestational age of >20 weeks admitted in the hospital and visited outpatient department during one year duration. Exclusion criterion of this study was patients having chronic hypertension, Gestational age of <20 weeks, Patients who were diagnosed with other causes of convulsions in pregnancy like cerebral malaria and epilepsy and Patients not willing to participate in the study. Data Analysis: The categorical variables were represented in number and percentage. Data was analysed using SAS version 9.1.

Results

A total of 102 patients with pregnancy induced hypertension were identified and managed using anti-hypertensive medications. In the present study, patients with age 22-25 yrs42 (41.7%) showed higher incidence of PIH followed by 18-21yrs 38 (37.25%).In this study

patients of primigravida 57 (55.88%) showed increased risk for PIH when compared to multigravida. In the present study, clinical symptoms like pedal oedema 90 (88.2%) followed by proteinuria 49 (47.65%) showed higher predominance in PIH. In the present study, patients with PIH were treated using Nifedipine70 (68.62%) and further details are given in table 1. In the present study, low birth weight 59 (57.84%) showed predominance in patients diagnosed with PIH. In this study, LSCS showed lower relative risk (0.91) in patients treated with nifedipine and remaining details are mentioned in the table 2. In terms of maternal outcomes in patients treated with Nifedipine, oligohydromnios and placental abrasion showed lower relative risk 0.85 and 1.14 respectively and other information was detailed in table 3. In this study, IUGR showed relative risk of 1.06 compared to other fetal outcomes in patients treated with Nifedipine were mentioned in table 4. In the present study, clinical outcomes in patients treated with Nifedipine and other drugs group was compared using p value and their details were mentioned in the table 5. In the present study, incidence of adverse effect like pedal edema was low in patients treated with Nifedipine 30(42.86%) when compared with other drugs 18(56.25%) and remaining details were mentioned in table 6.

Table -1: Distribution according to choice of drug

S. No	Drugs	No of pts	Percentage
1	Nifedipine+ labetalol and others	70	68.62
2	Labetalol and other drugs without nifedipine	32	31.37

Table – 2: Assessment of type of delivery in patients treated with Nifedipine

	Nifedipine				
		YES	NO	Relative Risk	Confidence Interval
		70	32		
LSCS	YES	44	22	0.91	0.68-1.22
	NO	26	10		
NVD	YES	28	08	1.22	0.94-1.57
	NO	42	24		

Table – 3: Assessment of maternal outcomes in patients treated with Nifedipine

	Nifedipine				
		YES	NO	Relative Risk	Confidence Interval
		70	32		
Nil	YES	43	19	1.03	0.68-1.22
	NO	27	13		
Oligo	YES	14	09	0.85	0.60-1.22
	NO	56	23		
Placental	YES	13	04	1.14	0.84-1.54
	NO	57	28		

Table – 4: Assessment of fetal outcomes in patients treated with Nifedipine

	Nifedipine				
		YES	**NO**	**Relative Risk**	**Confidence Interval**
		70	32		
Normal	YES	44	22	0.92	0.70-1.20
	NO	26	10		
IUGR	YES	18	07	1.06	0.79-1.42
	NO	52	25		
Still birth	YES	08	04	0.95	0.62-1.45
	NO	60	26		

Table - 5: Comparison of clinical outcomes in Nifedipine and other drugs group

	Nifedipine	**Without Nifedipine**	**P value**
Systolic BP	124.81± 18.46	132.16±19.52	0.0063
Diastolic BP	79.86±10.05	85.52±11.23	0.0002

Table-6: Distribution of adverse effects in patients on nifedipine and other anti- hypertensive.

Adverse Effects	**Without Nifedipine**	**Nifedipine**
Pedal edema	18 (56.25%)	30 (42.86%)
Headache	16 (50%)	26 (37.14%)
Sweating	19 (59.37%)	21 (30%)
Dizziness	22 (68.75%)	27 (38.57%)
Nausea and Vomiting	20 (62.5%)	25 (35.17%)
Facial Edema	17 (53.13%)	28 (40%)

Discussion

The aim of antihypertensive therapy in the management of pregnancy induced hypertension is to prevent complications due hypertension while prolonging the course of pregnancy. The aim of antihypertensive therapy is to achieve a blood pressure lower than 170/110 mm of Hg but not lower than 130/90 mm of Hg without compromising uteroplacental blood flow and placental perfusion. In the present study, the incidence of PIH and eclampsia was higher in the age group of 22-25 years followed closely by the age group of 18-21 years. Similar studies were conducted by Vidyadhar et al [1]and stated that maternal age less than 20 years was the strongest risk factor for both preeclampsia and eclampsia. Xu Xiong et al [10]concluded that mean maternal age for PIH was 25.8 years. The present study revealed that, PIH was more common among primigravida when compared to secondpara

and multipara. Studies conducted by Vidyadhar et al [1]revealed that 65% were primigravida among the study conducted in PIH patients. Thus primigravida are under higher risk for PIH than multigravida. It is now believed that the high risk is related to the maternal first exposure to chorionic villi, specifically the trophoblast, which is of fetal origin. Maximum numbers of patients were clinically presented with pedal edema followed by proteinuria. In eclamptic patient headache, vomiting and seizures are also associated with pedal edema and proteinuria. In the present study of the total women who developed PIH, 68.62% were prescribed with Nifedipine and other drugs (methyldopa, magnesium sulphate and furosemide). 31.37% were prescribed with labetalol and other drugs without Nifedipine. Similar results were supported in the study conducted by Punam D. Sachdeva et al[9]. Pregnancy induced hypertension increases the risk of low birth weight. In our study the incidence of low birth weight 59(57.84%) is higher than the ideal birth weight 43 (42.15%) which supported by a study "Impact of pregnancy induced hypertension on birthweight by gestational age" conducted by Xu Xiong et al [10]. As PIH is one of the major maternal complications, in order to prevent maternal and fetal mortality maximum cases are delivered by caesarean section unless vaginal delivery is impossible, LSVD showed relative risk lower than normal delivery concluding appropriateness of the management. In our study the adverse maternal outcomes are at lower incidence implicating efficacy of Nifedipine in PIH patients. The maternal outcomes observed in our study were oligohydromnios and placental having higher relative risk. Similar results were stated in the study conducted by Vidyadhar et al[1]. In this study the observed fetal outcomes were normal 66(94.28%) followed by IUGR 25(35.71%) and still birth 12(17.14%), and the relative risk is higher for IUGR. Similar results were concluded in the study conducted by Xu Xiong et al[10].Clinical outcomes of Nifedipine and other antihypertensives where compared and the p-value calculated showed significant efficacy of Nifedipine among other antihypertensives in PIH treatment and outcomes. Nifedipine was concluded to be the effective drug in treatment of severe hypertension in pregnancy and preterm labour by Patricia Smith et al [11]in their study. Results of our study showed lower incidence of adverse effects with Nifedipine, compared to other anti hypertensive drugs. A study conducted by Chava.Jhansi et al [12] concluded similar results.

Conclusion

PIH needs early diagnosis and treatment through regular antenatal checkups to prevent it and its complications. The incidence of PIH is high among the patients with age 22 to 25 yrs. Our study results implicated the efficacy of nifedipine in pregnancy induced hypertension in terms of clinical outcomes, type of delivery, maternal outcomes and fetal outcomes and incidence of adverse effects. Inclusion of Nifedipine in anti hypertensive treatment is founded to be fairly efficacious over treatment without it.

Conflicts of Interest: There are no conflicts of interest.

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Comparison of Immunization Coverage Status Reported through NFHS Coverage Evaluation Survey and HMIS in Maharashtra

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Abstract

Accurate health data is the most crucial factor for effective public health program evaluation, monitoring, planning, and implementation. There are many surveys conducted in India for collating information on the health status of the country, one of which is NFHS (National Family Health Survey). NFHS is a representative sample survey which collects evidence of trends in population, health and nutrition indicators including immunization status of children under five years of age. However, the public health system in India including Maharashtra is dependent on the reports generated by HMIS for assessment of immunization coverage status. There is a relatively large difference in immunization coverage estimates of NFHS-4 and HMIS reports. NFHS and HMIS both have differences in the purpose, design, and interpretation between the two. A deeper and more detailed analysis of the two systems and datasets is required to explore these differences and make evidence-based conclusions on data triangulation.

Key words: *Immunization data, NFHS, HMIS, data, comparison*

Introduction

National health programs are highly reliant on accurate and usable data for successful design and implementation, which is also crucial for identifying programmatic gaps and planning program amendments. In India, health data is commonly sourced from public health reporting system and representative surveys; less commonly from the private health sector. Multiple rounds of various health surveys like National Family Health Surveys (NFHS), District Level Household Surveys (DLHS) and Annual Health Surveys (AHS) have been conducted over past few years [(1)]. These surveys provide information on health indicators in a sample of representative individuals across the country. In spite of the availability of data collected from different surveys with overlapping goals, several gaps remain in the availability of health information in India [(2)] assess the availability of health data in the public domain, and review publications resulting from the National Family Health Survey (NFHS).

NFHS is a representative sample survey conducted throughout India. NFHS 4 which was conducted during 2015-16 included collection of information on health indicators from 29 states and six union territories. It collected evidence of trends in population, health and nutrition indicators. The health indicators focused on maternal child health and selected communicable and non-communicable diseases[(3)].

The recent evolution of National Health Mission (NHM) has provided an opportunity for the health system to gather real-time information and has gradually moved towards digitalization leading to the strengthened base of health information in Indian health system. Health Management Information System (HMIS) is an initiative launched in 2008 by NHM which is a digital

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platform for monitoring of service delivery with a focus on reproductive, maternal and child health. It captures 70 data items at sub-centers and 117 items at Primary Health Centres. HMIS has provided a platform for collection and aggregation of information which can be further analyzed and the information could be used for monitoring and thus better performance of health systems [4].

The HMIS portal primarily collects information related to Ante Natal Care (ANC) of pregnant women, deliveries and it's outcome, reproductive health and child care, especially the immunization status [5]. Reporting of immunization is an utmost important indicator to assess the health status of the population. Both NFHS and HMIS collects information on immunization from the population.

Background:

The public health systems in India including Maharashtra are dependent on the reports generated by HMIS for assessment of immunization coverage. Moreover, the information is also compared with the information obtained from the recent NFHS rounds. The information present in the public domain for access was used for this comparison. The total immunization reported by NFHS-4 (2015-16) in Maharashtra state is 56.3 % whereas the immunization reported by HMIS is 94.13%. Below is the district wise comparison of total immunization reported by NFHS-4 and HMIS report of the year 2015-16 (Table 1). The full immunization means vaccination with BCG, Measles, and three doses each of Polio and DPT/Penta in children of age-group 12-23 months.

Table 1: District wise comparison of immunization data reported by NFHS and HMIS

District	% of fully immunized as per NFHS data	% of fully immunized as per HMIS data
Ahmednagar	43.4	94.20
Akola	50.8	105.75
Amravati	(64.7)	93.95
Aurangabad	59.3	100.38
Beed	53.9	101.81
Bhandara	(81.1)	84.09
Buldhana	64.2	88.96
Chandrapur	(60.5)	96.53
Dhule	40.0	98.39
Gadchiroli	(82.0)	95.64
Gondia	74.4	84.73
Hingoli	65.9	99.25
Jalgaon	(43.2)	93.78
Jalna	70.0	94.66
Kolhapur	(46.9)	101.28
Latur	59.4	103.17
Nagpur	(76.5)	99.07
Nanded	51.1	97.14
Nandurbar	32.8	78.04
Nasik	62.3	97.77
Osmanabad	(62.7)	100.34
Parbhani	51.5	103.21
Pune	(81.0)	92.22
Raigad	(47.6)	78.34
Ratnagiri	(73.1)	91.84
Sangli	(43.4)	93.26
Satara	59.2	97.57
Sindhudurga	(80.3)	77.22
Solapur	64.9	97.28
Thane	40.9	88.01
Wardha	(76.5)	90.04
Washim	(67.9)	93.48
Yavatmal	61.6	94.95

Cont... **Table 1: District wise comparison of immunization data reported by NFHS and HMIS**

This relatively large difference in -reports of NFHS-4 and HMIS data raises several questions about the actual proportion of children in Maharashtra who are fully immunized. While this commentary is not a critique of either of the two systems, here we will try to explain factors that may be responsible for this difference and argue that the two reports are probably not comparable; instead, they have different purposes and can be complementary to each other.

Purpose

The National Family Health Surveys are nationwide surveys conducted with a representative sample of households throughout the country. They are designed to provide national, state and for the first time in NFHS-

4, district-level estimates of important indicators of family welfare, maternal and child health, and nutrition including estimates of children that are fully immunized. The NFHS rounds use standardized questionnaires, sample designs, and field procedures to collect data.

The HMIS is a regular health reporting portal in the public health system, i.e. it reports indicators related to maternal health, child health, communicable diseases and other health conditions from public health facilities as well as private facilities. Immunization status of children vaccinated at public health facilities is one of the important indicators that are regularly reported in the HMIS. The HMIS has a reporting structure that builds up from the government sub-centers to primary health centers and further to the district and state level. The HMIS includes data from all public health facilities in districts and state; thus it is not sample-based. The HMIS is an important tool that provides real-time data on health indicators and is used by government program managers as well as policymakers to understand the current health status of communities as well as design interventions to improve health programs including micro-level planning. The HMIS is valuable in identifying lacunae in program implementation and taking immediate corrective actions for the same.

Definitions

Both NFHS and HMIS follow guidelines developed by the World Health Organization wherein children are considered fully vaccinated when they have received a vaccination against tuberculosis (BCG), three doses of diphtheria, whooping cough (pertussis), and tetanus (DPT) vaccine; three doses of the poliomyelitis (polio) vaccine; and one dose of the measles vaccine by the age of 12 months. While the NHHS-3 reported both proportions of children fully immunized before 12 months of age as well as the proportion of children fully immunized at any time before the survey, the NFHS-4 state fact sheet for Maharashtra reports the only proportion of fully immunized children aged 12-23 months.

Method

The NFHS rounds are conducted at intervals that are not regular. While NFHS-1 was conducted in 1992-1993 and NFHS-2 in 1998-1999, the NFHS-3 was conducted in 2005-2006 and the NFHS-4 was conducted after an interval of 10 years in 2015-2016. The NFHS-4 round for Maharashtra gathered information from 26,890 households, 29,460 women, and 4,497 men. Indicators for child immunization was obtained from these 29,460 women as these were included in the women's questionnaire of the survey. All women were asked about vaccines received by all living children in the last five years prior to the survey. To obtain this information woman were first asked to produce vaccination cards for the children and data on individual vaccines along with the date of vaccination was recorded from these cards. If the card were not available, women were asked if their children had received vaccines and thus reported vaccination history was recorded. Data is collected over a period of approximately one year and primary reports are published within two years of data collection.

The HMIS is a regularly updated portal that records information on individual vaccines from vaccination registers maintained at government sub-centers, primary health centers, and other public health facilities. Every primary health center and sub-center are given a '*target population'*, i.e. children eligible for immunization that is estimated from census data and the actual number of eligible children immunized is calculated against the target population. Data on children immunized at other public health facilities are recorded at the primary health center where children reside. Data in HMIS is updated every month and made available to program managers. A critical component of the HMIS is monitoring and evaluation. Data in the HMIS is monitored at all levels from the sub-district level to the national level. At each level, the data is cross-verified by respective program managers and only then reported, thus ensuring the quality of the data.

Critical differences between NFHS-4 and HMIS

The NFHS rounds are sample surveys, with data collected from these sample households expected to provide estimates for the complete population. Though sample size calculations and sampling strategies have been statistically calculated to ensure adequate power and representativeness of the sample estimates, as with any sample survey, there remains an uncertainty in projecting sample data to the larger population, in this case, the complete population of the state and districts. Further, there is a time-lag between a collection of data and publishing results of the survey which can range from one to two years; while immunization trends at the national level usually are not expected to vary significantly, such a lag may not be useful to identify any acute weaknesses. The HMIS records program data on a real-time and regular basis. Data for all children

immunized at public health facilities are recorded in the HMIS and monthly reports are generated from the HMIS to facilitate calculation of number and proportion of children immunized. Thus the HMIS can inform the immunization program about monthly trends at all levels of the public health system

The NFHS surveys generate estimates at a given point of time and while trends in the status of child immunization can be statistically estimated from consecutive survey rounds. The HMIS, by virtue of its regularity of data recording, can provide relatively more accurate estimates of trends in immunization. However, calculation of the *'target population'*, i.e. all eligible children within a given area, which forms the denominator to calculate the proportion of children immunized, may have inaccuracies as it is estimated from the last census and data on new births available from government records. In addition, it is difficult to estimate in and out-migration while calculating *'target population'*. This inherent difficulty in fixing a denominator when using HMIS data is a known weakness in the system; which can be corrected to a large extent using statistical adjustments and more accurate population estimates. However, a discussion on this is beyond the scope of this commentary.

Data on individual vaccination in NFHS-4 was either recorded from vaccination cards or from mother`s recall. Further, data were recorded for all living children in the five years prior to the survey. The accuracy of data in case of unavailability of vaccination cards must be viewed with caution as mother`s recall is influenced by many factors, especially elapsed time in case of vaccinations given 3-5 years ago. While the NFHS-4 has yet to publish detailed estimates, the NFHS-3 reports that vaccination coverage for each type of vaccine and for full vaccination was much higher for children for whom a vaccination card was shown (76% for all vaccines) than for the children whose vaccination information is all based on mother's recall (24% for all vaccines). This seems to be a significant difference in the proportion of children vaccinated. However, the NFHS-3 report does not mention proportion of all respondents that had and did not have a vaccination card. If the proportion of respondents without a vaccination card was high, then there is a higher likelihood of under-reporting of vaccination, based only on maternal recall. Even among those with vaccination cards, the NFHS-3 did not report the completeness of vaccination cards as cards with incomplete information do not necessarily indicate incomplete immunization.

While all these factors do not comprehensively explain differences in immunization status between NFHS-4 and HMIS, there is enough evidence to show significant differences in the purpose, design, and interpretation between the two. Obviously, a deeper and more detailed analysis of the two systems and datasets is required to explore these differences and make evidence-based conclusions. Thus, interpreting either the NFHS-4 data or the HMIS data needs utmost caution when estimating immunization status of the complete population. At this juncture, it is advisable to not draw conclusions about the same before exploring further. A direct comparison between the two datasets would neither be appropriate nor would it generate actionable evidence. Rather, it would be more judicious and efficient to consider the two datasets as complementary to each other and apply appropriate statistical methods to use both to arrive at population immunization proportion estimates.

Conclusion

All these raise a question if actual information could be compared with the estimated one. Although this could be one possible way to compare the actual information, many comparisons could be done if raw data of both the data sets could be made available. We can also independently analyze the available health systems data and publish it responsibly in peer-reviewed journal which would give credibility to the use of health system data for various reasons and purposes. Probably data triangulation exercises including a combination of the two datasets along with an independent verification would provide the most realistic estimates of immunization coverage. Thus, we could initiate by using available data from health systems to produce credible publications to utilize the potential of such datasets for better tomorrow.

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Ethics: The data used are reports available in public domain which do not include any individual level datasets hence no separate ethical approval was required.

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Skin Diseases Prediction: Binary Classification Machine Learning & Multi Model Ensemble Techniques

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Abstract

Unlike many other diseases, the skin disease has more irritability. Dermatology sicknesses incorporates normal skin rashes to serious skin contaminations, which happens because of scope of things, like diseases, warm, allergens, framework issue and drugs. First regular skin issue are dermatitis. Atopic dermatitis is relating current (perpetual) condition that causes eager, aroused skin. Most much of the time it appears as patches on the face, neck, trunk or appendages. It will in general erupt sporadically so die down for a period. A large portion of the dermatological sicknesses are not reparable but rather most the treatments depend on the administration of the side effects related with it.

The focus of this research will be the Dermatology database. The problem is to determine the type of Eryhemato-Squamous disease like psoriasis, seboreic dermatitis, lichen planus, pityriasis rosea, cronic dermatitis and pityriasis rubra pilaris. The differential analysis of erythemato-squamous maladies is a genuine issue in dermatology. They all offer the clinical highlights of erythema and scaling, with next to no distinctions. Each pattern is a set of 33 numbers in the range linear values and one of them is nominal. The 80% of the dataset utilize for demonstrating and keep down 20% for approval. Objective is to accomplish best performer algorithm which will convey in dermatology informational collection so for this reason the gut feel recommends distance based calculations like k-Nearest Neighbors and Support Vector Machines may progress admirably. By using 10-fold cross validation and assess calculations utilizing the accuracy metric.

Keywords: *Dermatology, Atopic dermatitis, Eryhemato-Squamous, k-Nearest Neighbors, Support Vector Machines.*

Introduction

Around 1500 BC a medical document on skin ailments Ebers Papyrus was found in ancient Egypt. It portrays different skin maladies, including ulcers, rashes, and tumors, and recommends medical procedure and balms to treat the afflictions [1, 2]. From that point to now the skin sickness portion has indicated colossal development. The predominance of skin malady in India is 10 to 12 percent of the all out populace with Eczema and Psoriasis being the significant benefactors. Because of contamination, bright light, and an unnatural weather change, photosensitive skin issue like tanning, color obscuring, sunburn, skin malignant growths, and irresistible infections are expanding at a quicker pace. A one percent decrease in ozone prompts a two to four percent expansion in the occurrence of tumors. The seriousness of developing skin illnesses in India is additionally underlined by the way that the World Health Organization (WHO) has included skin infection under the most widely recognized non-transferable maladies in India. What's more, there is an absence of offices that give thorough skin related medicines under one rooftop." The circumstance is additionally compounded by the low accessibility of dermatologists in India. At present, there are around 6,000 dermatologists obliging a populace of more than 135 crore. This implies for each 100,000 individuals, just 0.49 dermatologists are

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accessible in India when contrasted with 3.2 in numerous conditions of the US." Different tertiary consideration private setups come up short on the capacity to treat incessant, hereditary and pediatric skin diseases.

Literature Survey

Investigating the ups and downs of the computerized skin disease conclusion system, several available arrangements are still under research and development. The difference between certain obstacles and shortcomings is that this arrangement subsequently attempts to overcome current problems in a variety of ways.

The different conclusions of erythema - squamous disease are a thorny problem in dermatology. They all provide clinical highlights of erythema and scales, with little difference. The disease at this gathering was psoriasis, sebaceous glands, lichen planus, pityriasis rosea, permanent dermatitis and pityriasis of the hair [3]. Some tests have been carried out in consideration of the discovery of erythematous squamous disease. These surveys link various technologies to specific issues and complete the unique correctness of the representation. In these investigations, the main work of the differential analysis of erythematous squamous disease is Table 1.

Table 1: A few investigations which have dealt with skin disease mining

Author	**Year**	**Method**	**Classification accuracy**
Bojarczuk[4]	2001	A constrained-syntax genetic programming C4.5	96.64% 89.12%
Chang et.al [5]	2009	decision tree neural network	80.33% 92.62%
Guvenir et al.[6]	1998	VFI5	96.2%
Ubeyli and Guler[7]	2005	ANFIS	95.5%
Nani[8]	2006	LSVM RS B1_5 B1_10 B1_15 B2_5 B2_10 B2_15	97.22% 97.22% 97.5% 98.1% 97.22% 97.5% 97.8% 98.3%
Polat and Gunes[9]	2009	C4.5 and one-against-all	96.71%
Ubeyli[10]	2009	CNN	97.77%
Ubeyli and Dogdu[11]	2010	K-mean clustering	94.22%
Lekka andMikhailov[12]	2010	Evolving fuzzy classification	97.55%
Xie and Wang[13]	2011	IFSFS and SVM	98.61%
A.A.L.C. Amarathunga et al[14]	2015	AdaBoost BayesNet J48, MLP NaiveBayes)	85% for Eczema 95% for Impetigo 85% for Melanoma.

Method

Initially, differential expression analysis was used to select erythema-scaly, the most informative feature of significant differential expression, and then fed into the following classification process. Then, we use S-fold cross-validation technology to divide the initial data into k groups, training and test data sets. After that, multiple algorithms used for evaluation are learned from the training sets, each of which consist of k-1 of the k groups, and then applied to the corresponding test set, which is the remaining group of the S groups, to output the predicted class of the samples. Then, we will evaluate algorithms using the accuracy metric. This is a general indicator that quickly understands the correctness of a given model. We created a performance baseline on this issue and scrutinized many different issues of algorithms. Now we evaluate the same algorithms with a standardized copy of the dataset because we have the reason to suspect that the differing distributions of the raw data may be negatively impacting the skill of some of the algorithms. In this section we investigate tuning the parameters for most prominent algorithms that show promise from the spot-checking in the previous section. In next section, an ensemble model is another way to improve the accuracy by using four different machine algorithms; two boosting and two bagging methods. We will finalize the model by training it on the entire training dataset and make predictions for the hold-out validation dataset to confirm our findings. We can calculate from the entire training data set and apply the same transformation to the input properties of the validation data set. Finally, the algorithm-adjusted prediction is compared with the aggregate model to reduce the generalization error and obtain more accurate results [15-20].

Evaluation of Algorithms

After the pre-processing of information collection, we evaluated the expected execution of six well-known classification techniques for finding skin diseases. Specifically, we apply Logistic Regression (LR), Linear Discriminant Analysis (LDA), k-Nearest Neighbor (KNN), Classification and Regression Tree (CART), Gaussian Bayesian (NB), Support Vector Machine (SVM). As the first time to arrange the classification model. These six classification strategies are highly accurate in practical applications.

Ensemble Methods

In this research paper ensemble method is used as a method to find the accuracy of the skin disease dataset to improve the performance of algorithms. We will evaluate four different ensemble machine learning algorithms, two boosting Ada Boost (AB) and Gradient Boosting (GBM) and two bagging methods Random Forests (RF) and Extra Trees (ET).

General Procedure of Boosting

The word "boost" refers to a set of algorithms that can transform weak learners into strong learners. Of course, weak learners are only slightly better than irregular guesses, while powerful learners are very close to perfect execution. If the appropriate response is positive, then any weak learner can be promoted to a strong learner, especially if it is difficult to obtain a strong learner rather than a weak learner. The promotion is done by continuously preparing a large number of learners and merging them into expectations, and later learners pay more attention to the mistakes of previous learners.

Input: Distribution of sample S;
Learning base algorithm A;
Total number of learning rounds N.
Process:
1. $S_1 = S$. # Initialization of distribution
2. for n = 1, . . . , N :
3. $h_n = A(S_n)$; # A weak learner trained from distribution S_n
4. $\mu_n = P_{x\sim Sn}(h_n(x) \neq f(x))$; # Evaluation of the error of h_n
5. S_{n+1} = Adjustment of Distribution (S_n, μ_n)
6. end
Output: H(x) = Combine Outputs ($\{h_1(x), \ldots, h_n(x)\}$)

Input: Distribution of sample S = {(x_1, y_1), (x_2, y_2), . . . , (x_m, y_m)};
Learning base algorithm A;
Total number of learning rounds N.
Process:
1. for n = 1, . . . , N :
2. h_n = A(S, S_{br}) # S_{br} is the bootstrap distribution
3. end
Output: $H(x) = \arg\max_{y \in Y} \sum_{n-1}^{N} (\mathrm{hn}(x) = y)$

Bagging Methods

The name Bagging originated from the contraction of Bootstrap AGGregatING. As the name implies, the two key elements of Bagging are bootstrap and aggregation. For training information collection, one probability is to examine various uncovered data subsets by all accounts, and after this preparation is the underlying learner from each subset. In any case, because we do not have endless training data information, such a program will provide few and non-representative examples, resulting in poor implementation of the underlying learners. The bag receives a guided loop to create a diverse base learner. It applies a bootstrap check to get a subset of the data used to prepare the underlying learner,

Results

Here we utilized distance based algorithms like k-Nearest Neighbors and Support Vector Machines We have utilized 10-fold cross validation. The data set isn't excessively little and this is a decent standard test saddle setup. We will assess algorithms utilizing the exactness metric. This is a gross metric that will give a fast thought of how right a given model is. Progressively valuable on binary arrangement issues like this one. Making a standard of act on this issue and spot-check various distinctive algorithms. We will choose a suite of various algorithms fit for dealing with this classification issue. The algorithms all utilization defaults tuning parameters. On comparing the algorithms mean accuracy values are given in following table 2.

Table 2: Output of Evaluating Algorithms

Algorithms	Mean Accuracy Values
LR	0.979425 (0.022806)
LDA	0.962299(0.024175)
KNN	0.855747 (0.051314)
CART	0.935057 (0.028180)
NB	0.890230 (0.072177)
SVM	0.921034 (0.027220)

Evaluation of Algorithms with Standardize Data

We speculate that the differing distributions of the raw data might be adversely affecting the ability of a portion of the algorithms. How about we assess similar algorithms with an standardized copy of the data set. This is the place the data is changed with the end goal that each attribute has a mean estimation of zero and a standard deviation of one. We likewise need to maintain a strategic distance from data leakage when we change the data. A decent method to keep away from data leakage is to utilize pipelines that standardize the data and construct the model for each fold in the cross validation test bridle.

Table 3: Output of Evaluating Algorithms on the Scaled Dataset

Algorithms	Mean Accuracy Values
ScaledLR	0.972529(0.025776)
ScaledLDA	0.962299(0.024175)
ScaledKNN	0.969195(0.018533)
ScaledCART	0.938391(0.029970)
ScaledNB	0.869655(0.087102)
ScaledSVM	0.969310(0.023769)

We can see that LR is as yet progressing admirably. We can likewise observe that the standardization of the data has lifted the aptitude of SVM to be the most precise algorithm tried up until this point. See Table 3.

The outcomes propose delving further into the LR and SVM algorithms. Almost certainly, setup past the default may yield significantly increasingly precise models.

Ensemble Methods

Another way that we can improve the execution of algorithms on this issue is by utilizing ensemble strategies. We will utilize a similar test tackle as previously, 10-fold cross validation. No data standardization is utilized for this situation since each of the ensemble algorithms depend on decision trees that are less sensitive to information distributions. See table 4.

Table 4: Output of Evaluating Algorithms

Algorithms	Mean Accuracy Values
AB	0.588391 (0.062920)
GBM	0.959080 (0.036807)
RF	0.959195 (0.036403)
ET	0.969310 (0.041881)

Finalization of Model

In view of the results, The LR demonstrated the most guarantee as a low intricacy and stable model for dermatology dataset. In this section we will conclude the model via preparing it on the whole training dataset and make predictions for the hold-out validation dataset to affirm our findings. A part of the findings was that LR performs better when the dataset is standardized so all characteristics have a mean estimation of zero and a standard deviation of one. We can ascertain this from the whole training dataset and apply the equivalent change to the input properties from the validation dataset.

We can see that we accomplish an exactness of about 99% on the held-out validation dataset. A score that more and improved to our desires evaluated above amid the tuning of LR. See table 5.

Table 5: Output of Evaluating SVM on the Validation Dataset.

accuracy_score	**0.9864864864864865**
confusion_matrix	[[11 0 0 0 0 0] [0 11 0 0 0 0] [0 0 13 0 0 1] [0 0 0 4 0 0] [0 0 0 0 24 0] [0 0 0 0 0 10]]
classification_report	precision recall f1-score support cronic dermatitis 1.00 1.00 1.00 11 lichen planus 1.00 1.00 1.00 11 pityriasis rosea 1.00 0.93 0.96 14 pityriasis rubra pilaris 1.00 1.00 1.00 4 psoriasis 1.00 1.00 1.00 24 seboreic dermatitis 0.91 1.00 0.95 10 avg / total 0.99 0.99 0.99 74

Conclusion

Skin disease is a disturbing and real medical issue around the world. In spite of the fact that the machine learning strategies have been increasingly more generally utilized in disease expectation, nobody technique beats all the others. In this paper, we exhibited six diverse order models and multi-model ensemble way to deal with the prediction of skin disease. The outcomes demonstrate that differential expression analysis is important to diminish the dimensionality of data and to choose effective data, along these lines expanding the accuracy of the prediction and decreasing the computational time to a substantial degree. The multi-model ensemble method at that point uses the expectations of numerous diverse classification models as input. The classification technique decreases the generation error and acquires more data by utilizing the principal organize predictions as highlights than it is trained in isolation. Also, by utilizing classification techniques, the mind boggling connections among the classifiers are found out consequently, in this way empowering the order strategy to accomplish better prediction.

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Competing Interests None declared

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Compressive Strength Evaluation between Metal Ceramic and Zirconia Crowns. An in-Vitro Study

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Abstract

The aim of this study is to evaluate the compressive strength of metal and zirconia cores and also the point of chipping of the veneered porcelain to both the core materials. For the present study, full coverage crowns were fabricated for mandibular molar. The crowns were divided into two groups. First group is five samples of metal ceramic crowns and second group is five samples of zirconia ceramic crowns. These crowns were subjected to static compression loading in a universal testing machine until the fracture of the veneering porcelain. The compressive load was recorded in newton. Data were subjected to student t test analysis. Mean compressive strength for group 1 metal ceramic crowns was 2587.80N and the mean compressive strength for group 2 zirconia ceramic crowns was 1361.00N. The compressive strength of metal when being used as a core material is significantly higher than zirconia. Under static compressive loading, the point of fracture of the veneered porcelains occurred at significantly lower values for the zirconia based restorations when compared to that of metal ceramic restorations.

Keywords*: zirconia, metal ceramic, compressive strength, chipping.*

Introduction

Fixed prosthodontic treatment involves the replacement and restoration of teeth by artificial substitutes that are not readily removed from the mouth. Its focus is to restore function, esthetics and comfort[1]. For the past 40 years the porcelain-fused-to-metal systems have been extensively used in fixed partial dentures (FPDs) and still represents the gold standard. The advantages of the PFM systems are to combine the fracture resistance of the metal substructure with the esthetic property of the porcelain[2]. The drawbacks of these restorations are that the bulk of the natural tooth may need to be sacrificed to provide adequate space to ensure adequate fracture resistance and aesthetics[3]. However, recently the increasing demand for esthetic restorations as well as the questionable biocompatibility of some dental metal alloys has accelerated the development and improvement of metal-free restorations.[4]

All ceramic restorations have become more widely distributed due to their high esthetic potential and their excellent biocompatible properties[5]. Zirconia (ZrO2) is a ceramic material with adequate mechanical properties for manufacturing of medical devices[7]. Since it was introduced in Dentistry, the polycrystalline zirconium dioxide (zirconia) resulted particularly attractive in prosthodontics, due to its excellent mechanical properties and improved natural-looking appearance compared to metal–ceramics. Zirconia stabilized with Y_2O_3 has the best properties for these applications. Zirconia is a crystalline dioxide of zirconium[10].

The first proposal of the use of zirconium oxide for medical purposes was made in 1969[12]. Zirconia exhibits a phenomenon called "transformation toughening," which disables the progress of crack growth and increases toughness against fractures[14]. The tetragonal crystals of zirconium oxide are metastable and the stress applied to cracks or flaws can transform them into larger monoclinic crystals[15]. Yttrium partially stabilized tetragonal zirconia poly crystal (3Y-TZP) is made of transformable t-shaped grains stabilized by the addition of 3mol% yttrium-oxide (Y2O3). Such a polycrystalline material exhibits low porosity and high density; at the moment it is the most popular and frequently used form of zirconia commercially available for dental applications[20].

COMPRESSIVE STRENGTH

In the study of strength of materials, the compressive strength is the capacity of a material or structure to withstand loads tending to reduce size. It can be measured by plotting applied force against deformation in a testing machine[21]. Some material fracture at their compressive strength limit; others deform irreversibly, so a given amount of deformation may be considered as the limit for compressive load.[2] Compressive strength is often measured on a universal testing machine[23].

Dental ceramic materials exhibit many desirable material properties, including biocompatibility, esthetics, diminished plaque accumulation, low thermal conductivity, abrasion resistance, and color stability[24]. However, brittleness and low tensile strength are weak points of ceramic materials. Therefore, the clinical success of all-ceramic fixed partial dentures (FPD) has been disappointing, especially for posterior FPDs when compared with metal-ceramic restorations. Although metal frameworks have inherent disadvantages, studies reveal that the resistance to fatigue failure is comparatively more for metal ceramic restorations when compared to all ceramic restorations.[25]

Porcelain materials present two problems associated with occlusal forces: fracture of the porcelain, which is dependent upon the size and direction of the force (e.g., normal chewing versus bruxing), the type of porcelain (e.g., feldpathic, versus lithium disilicate, versus zirconia), and the time of force application; and wear of the material and its antagonist, whether natural enamel or other restorative materials. This is dependent upon the type of porcelain, quantity and timing of force, glazed versus polished porcelain, and the nature of the antagonist.[27]

Method

For the present study, full coverage crowns fabricated for mandibular first molar were tested for compressive strength. Materials used subjected to testing include:

1) Metal ceramic

2) Zirconia ceramic *(Table 1)*.

In order to standardize the crowns, a conventional tooth preparation was done on a mandibular first molar typhodont tooth model (Nissin)[29]. A full arch mandibular impression tray was used to make impression of the prepared tooth model using Aquasil soft putty/ regular set (DENTSPLY) and Aquasil ultra LV, type 3: light bodied consistency (DENTSPLY) using the double mix technique (fig 1) . The impression was poured using type IV dental stone. The dies were casted in cobalt chromium alloy[32] (fig 2).

Fig. 1 - Impression of prepared Typhodont tooth model

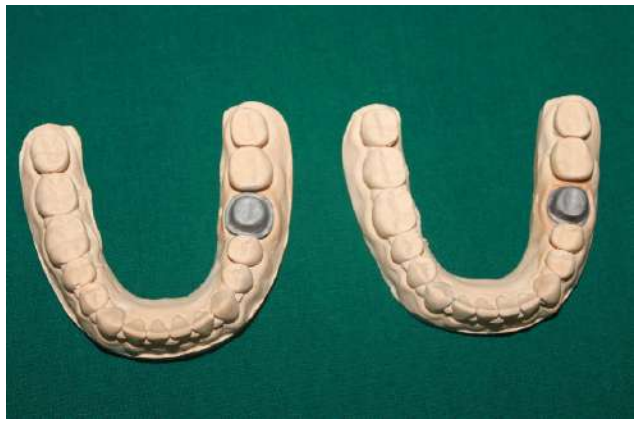

Fig. 2 - Cobalt chromium dies

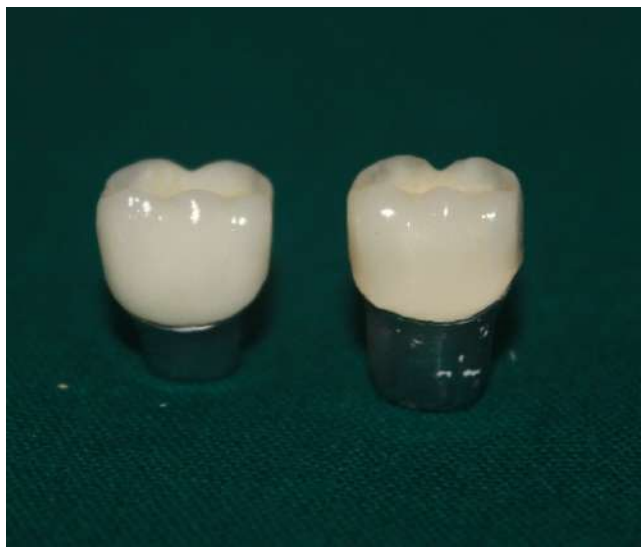

Fig. 3 - Fabricated crowns on the dies

Bonding Casts To The Crowns

Once fabricated, the crowns were bonded onto the metal dies (fig 4) using dual polymerization composite resin cement (Rely X U 200,3M.) and light cured for a period of 20 seconds for initial setting of the material (fig 5).

A force of 10 N was applied for 5 minutes to ensure even distribution of the bond material and seat the crowns properly[34]. After the cement had set the excess cement were removed from the margins of the restoration .

Fig. 4 - Crowns cemented on the stabilized dies

Fig. 5 - Light curing done for initial setting of the cement

Compression Testing

The compression testing was carried out using a universal testing machine (Instron model: WDW-100). The load applicator (4mm metal ball) descended onto the samples (fig 6) exercising a continuous force with a vertical cross head speed of 1mm/min, moving vertically downward perpendicular to the occlusal zone.

The load force applicator's ball established three point contact with the slopes of the vestibular cusps. Static compression loading was carried out until chipping or fracture took place of the veneered porcelain to the corresponding core material. This value was recorded in Newton (N). The data obtained was tabulated and analyzed using student t-test analysis.

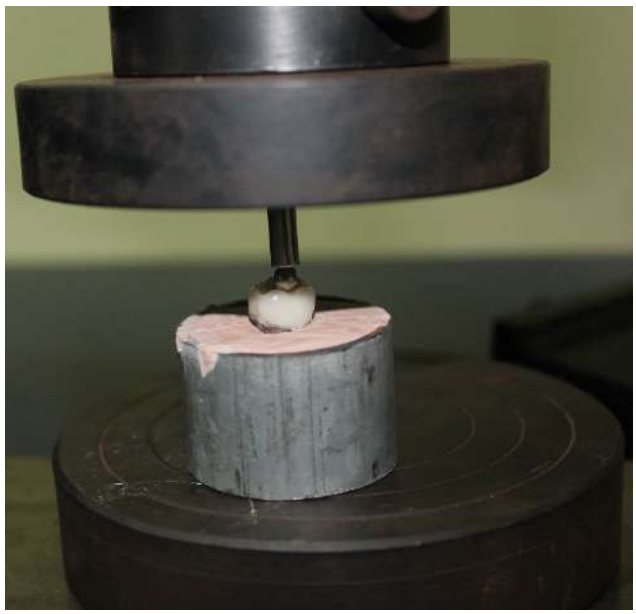

Fig. 6 - Static compression loading done on the samples

Results

Five samples were tested for compressive strength of metal ceramic in which chipping of veneering porcelain was at maximum of 2908N and minimum of 2300N.

Five samples were tested for compressive strength of zirconia ceramic in which chipping of veneering porcelain was at a maximum of 1500N and minimum of 1000N.

Mean values of compressive strength for metal ceramic and zirconia crowns were 2587.80 and 1361.0 N respectively (Table 1). These values were subjected to independent student t-test analysis (Table 2). The t-value obtained was 7.880 with degree of freedom (df) being 7.589 (Table 2). There was a statistically significant difference between the compressive strength of metal ceramic and zirconia crowns (p=0.000) (Table 3).

Discussion

With regard to biting forces in the oral cavity, compressive strength of materials used in fixed restorations plays a significant role in the durability and longevity of the prosthesis. Normal chewing cycle starts

with opening movement from centric occlusion, lateral movement and closure on to working side. Then finally shear movement against slopes of the upper teeth to grind the food particles and bring the jaw back to centric occlusion. The para functional habits like clenching includes sustained amount of compressive forces in centric occlusion, whereas bruxing include sustained compressive and shearing forces.

The choice of compressive test type and its specific design used in this study is best suited to study the resistance of ceramic materials. These have been substantiated by numerous authors (Snyder et al, Panadero et al). The compressive testing would therefore appears to be a validated method for evaluating fracture resistance of crowns or fixed partial dentures. Furthermore the cross head speed (1mm/min) and static compressive load were established in light of a literature review dealing these variables.

Despite the many disadvantages of in vitro study it is important to evaluate isolated mechanical properties under standardized conditions and limited influencing parameters. Although compressive strength does not reproduce conditions in the oral environment as faithfully as in vitro cyclic studies, the results of this type of test provide valid information, which can then be extrapolated in clinical practice.

All-ceramic crowns are subject to fracture during function. To minimize this common clinical complication, zirconium oxide is the material of choice used for the framework of all-ceramic crowns**. Kelly** suggested several recommendations for a clinically relevant *in vitro* load-to-failure test for all-ceramic restorations: use of a die material with elastic modulus similar to dentin, failure test under wet cyclic loading, preparation of the teeth or dies according to clinical guidelines and use of all-ceramic crowns with clinically relevant dimensions.

In the current study, some experimental conditions were different from Kelly's recommendations. The elastic modulus of the die material in this study is higher than that of dentin. However, natural teeth are hard to be standardized in size, mineralization, internal cracks, pulpal chamber dimension, and mechanical properties and would have fractured under the high compressive loads exerted during the test. Clinically, restorations are subjected to dynamic complex loading in saliva, which contains both organic and inorganic components. These conditions are quite different from the conditions used in this study; thus, further investigation should be carried out using stress corrosion or corrosion fatigue methodology so that the long term performance of restorations can be predicted.

The typical failure pattern of a veneering material in the daily clinical practice is known as ceramic chipping. For metal ceramics restorations, the linear coefficient of thermal expansion for metal and ceramic must closely match to achieve a strong interfacial bond. A small mismatch between these two factors results in an unknown amount of residual stress at the interface. This stress is usually confined to the veneered porcelain only.

The bond between veneering ceramic and zirconia framework is currently the subject of comprehensive investigation, when compared to that of metal ceramic restorations and this forms the basis of this study. The results of the present study show that the point of chipping or fracture of the veneering porcelain for the metal ceramic restorations ranges from 2000 to 3000N. Subsequently the chipping for the zirconia based restorations ranges from 1000 to 1500N. There is a statistically significant difference between the two groups.

From the present in vitro study, it may be confirmed that porcelain veneers with the same characteristics behave in response to static loading differently depending on the type of core they cover. Zirconia restorations fracture at lower static load values. Porcelain veneer over a metal ceramic core resisted higher static loading.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Not required as it is an in-vitro study

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A Study on Patients of Scrotal Dermatitis

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Abstract

Scrotal dermatitis is among one of the very common dermatological condition that has been easily overlooked by dermatologists ,treating physicians as well as by patients. The condition is easily mistaken for the common skin disorders affecting the area, like Tinea and scabies. This study will try to find out the various etiological factors and the management of the condition. 85 Male patients between the age group of 15 to 78 years were enrolled in a study period of 8 month. Majority of patients (48.2%) were wearing jeans regularly.54% of patients were wearing Jocky type of underwear. Medicated soaps were used by 30% of patients. 23% of patients were using antiseptic liquids for cleaning the area. Deodorant spray was used by More than 21% of patients. 75.6% of patients used combination creams (self medicated). On examinations 63.5% of patients were having erythema of some grade. Thickening of scrotal skin were observed in 60% of cases.Superficial to deep ulceration /erosion were present in 41.2% of patients. Scabies nodules were present in 22.4% of patients. Associated Tinea cruris was observed in 32.9% of patients. However, fungus infection of scrotum was found in 17.6% of cases.17.6 % of cases were having associated bacterial infections. Irritant reactions/ contact dermatitis was most common cause of scrotal dermatitis observed in 44.7% of cases, followed by neurodermatitis (LSC) in 30.5% of cases.

Key words: *Scrotal dermatitis, Irritant dermatitis scrotum, Scrotal pruritis*

Introduction

Scrotal dermatitis may present in different morphological features and is characterized by severe itching, erythema, scaling, erosion, fissuring and lichenification of the scrotal skin. Apart from these, there may be loss of hairs, Multiple factors are responsible for the condition, the most important being psychological stress and contact dermatitis either allergic or irritant. The condition has been easily diagnosed as fungal infection of the scrotal area. Due to wide spread use of antiseptics ,irritant ,soaps, sprays, hygiene wash and many topical agents, nowthis condition has become very common.

Though very common condition, very limited literature has been published on scrotal dermatitis either because of under reporting by the practitioners. Probably "scratching the balls" is considered as a common male habit.

Though the condition can be treated easily, it causes significant physical and psychological morbidity to the patient in the form of persistent or recurrent symptoms and social embarrassment. Also there is tendency for recurrence, as mostly we stress on medicines part but we ignore the factors behind the condition. Mostly busy practitioners do not explain in detail the factors behind it and the preventive measures to be taken.

Aims and Objectives

1. To classify the different dermatosis affecting the scrotum.

2. To find out the various physical, psychological and chemical factors responsible for this.

3.To treat and to educate the patient to prevent future recurrences.

Material and Method

A total of 85 male patients above age of 15 years attending dermatology OPD in Saraswathi institute

of medical Sciences, Hapur and School of Medical Sciences & research, Gr Noida were included in study. The duration of study was from January 2019 to August 2019. A questionnaire was prepared and all the details including socioeconomic status, personal habits, dressing pattern, type of underwear, toiletries including perfume spray, hygiene wash, antiseptic lotions was also noted. Informed consent was also taken. Proper examinations of the area in good day light condition was done. Any sign of inflammation, thickening, lichenification, ulcerations /erosions, loss of hairs were also recorded. In suspected patients KOH examination was done to rule out dermatophytosis. The final diagnosis was made. The patients were treated and observed for 2 months after successful treatment. Any recurrence was recorded. The patients were advised to change their habits and change their toiletries and dressing pattern.

The data was recorded, tabulated and analyzed by using SPSS software version 20. Percentage, mean and chi square test was used for statistical significance and P value <0.05 &<0.001 were considered significant.

Results

The total numbers of 85 cases were recorded in the department of dermatology were as follows:

Table 1: Characteristics of patients

Age group (Years)	No.	Percentage
15-29	27	31.8
30-44	30	35.3
45-59	15	17.6
60-74	10	11.8
75+	3	3.5
Socio-economic status		
High	12	14.1
Lower	13	15.3
Lower Middle	30	35.3
Middle	30	35.3
Associated Diabetes Mellitus		
Yes	12	14.1

The age of patients was in the range of 15 years and 78 years with mean age of 39.6 years. Majority of patients belonged to between age group of 30 to 45 years (35%) followed by age group of 15 to 29 years (31.8%). Only 3.5% patients were above age of 75 years.

Out of 85 patients, highest number of patients belonged middle and lower mid socioeconomic status 35.3 % each.

Out of the 85 patients, majority (41) were wearing jeans daily for the most of the time (48.2%). 30 patients (35.3%) were wearing pant daily. Pajamas were worn daily by 12 patients (14.1%).Only 2 patients (2.45) were wearing dhoti regularly.

Jocky type (V shaped) underwear were regularly worn by majority of patients 46(54.1%) . Loose Desi or boxer type were worn by 26 patients (30.6%). Long and

tight underwear were worn by 13 patients (15.3%).

Except 5 patients (5.9%) all were using soaps for cleaning the area involved and for regular bathing. Majority of patients were using mild soaps (31, 35.3%). Soap with chemicals were used by 26 patients (30.6%). Herbal soaps were used by 12 patients (14.1%). While 2 patients were using detergent bars for bathing. Surprisingly 3 patients (3.5%) were using V wash (Female hygiene wash) over the area.

20 patients (23.6%) used liquid antiseptics like Dettol, Savlon etc. for cleaning the area or for bathing purposes.

Deodorants over the area was used by 18 patients (21.2 %).

4 Patients (4.6%) used Dithranol (a highly irritant ointment used in treatment of psoriasis) leading to severe irritant contact dermatitis.

35 (41.2%) patients were using various antifungal creams over the scrotum. Most commonly been Luliconazole and Miconazole. One patient used Zalim lotion (containing salicylic acid and herbal ingredients) leading to acute irritant contact dermatitis.

Antihistamines were used by majority of patients 75(88.2%) most commonly being Cetirizine and Pheniramine Maleate.

Clinical Features

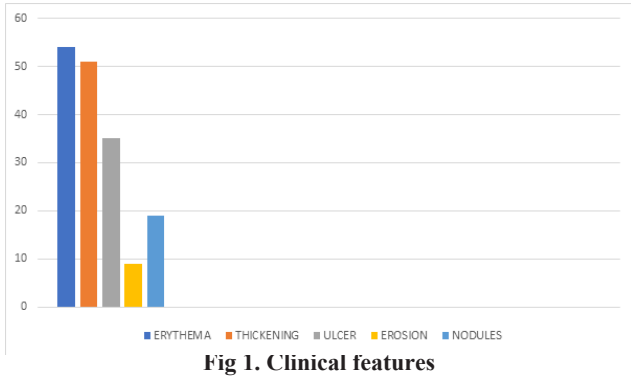


Fig 1. Clinical features

Various grade of Mild to deep erythema were observed in 54 (63.5%) cases. Some grade of thickening of scrotal skin was observed in 51 (60%) cases. Superficial to deep painful ulceration were observed in 35 cases (41.2%), Nine patients(10.6%) showed erosion with serous discharge.

Nodules over the scrotal skin (old or active scabies) were observed in 19 (22.4%) of patients.

Associated Tenia Cruris were observed in 28 patients (32.9 %). Associated Intertrigo was observed in 9 patients (10.6 %). Skin scrapping and KOH mount tests were performed in suspected cases. 15 patients were found positive for superficial dermatophytosis.

15 patients (17.6 %) were also having associated bacterial infections like folliculitis,furunculosis and infected eczema over the scrotal skin.

11 patients were having diabetes with HbA1c level more than 7.

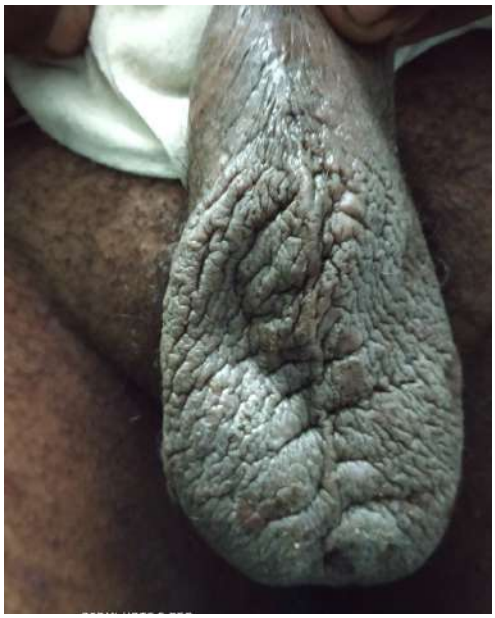
Table.2 Age wise distribution of non venereal dermatosis of scrotum

Age Group Non- Venereal Genital Dermatosis	15-29 Years	30-44 Years	45-59 Years	60-74 Years	75 +	Total	Chi-Squre Value	P Value	Result
*Irritant / Contact Dermatitis	20	11	5	1	1	38	57.317	<0.004	Highly significant
Scabies	3	7	6	4	1	20			
Fungal Infection	3	7	2	1	0	13			
Bacterial Infection Alone	1	1	0	3	0	5			
Lichen Simplex Chronicus	2	9	9	6	1	26			

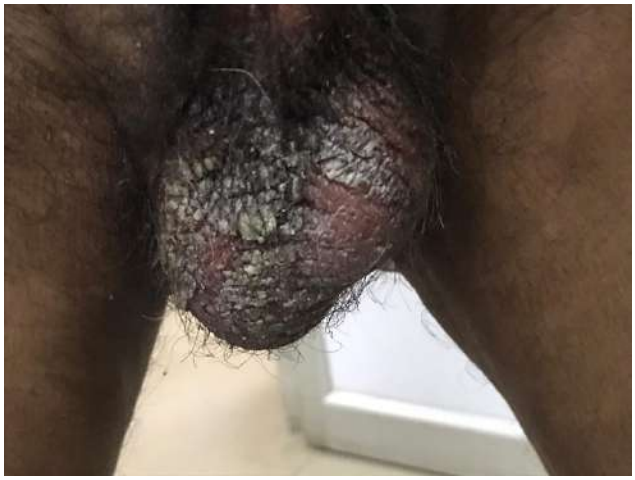
Irritant and /or contact dermatitis was most common cause of scrotal dermatitis in 38 cases (44.7%) of cases , followed by Lichen simplex chronicus (Neurodermatitis) was present in 26 cases (30.5%). Scabies infestation over scrotum was present in 20(23.5%) cases.Fungus infection could be confirmed mycologically only in 13 cases (15.3%). Bacterial infections like folliculitis were present in 5 cases (5.9%).a highly significant association was observed between type of dermatitis & age ($p<0.004$).

Treatment and response

All the patients improved with the treatment, but in 18 patients (21.2%) there was recurrence of symptoms after the successful treatment. Out of these 18 patients, 7 did not follow the instructions.



Lichen Simplex Chronicus



Acute irritant dermatitis

Discussion

Scrotal dermatitis is among one of the very common dermatological condition having multifactorial origin. In a study in year 2017 by Dipali Rathod et al [4] in non-venereal dermatosis in both females and males showed scrotal dermatitis in 16 % of cases, if we take only male patients in consideration the percentage will come 21.3%. In another study by M Kanta Prasad Rao[7] over male patients ,13 % of patients were having Scrotal dermatitis. The etiological factors are multifactorial & can be classified as:

1. Irritant or allergic reactions to soap or detergents

2. Topical antiseptics like Chlorxylenol, Triclosan, Cetrimide ,Chlorhexidine etc

3. Topical antibiotics like Neomycin, Gentamycin etc

4. Topical Antifungal creams and salicylic acid / benzoic acid based preparations.

5. Diabetes Mellitus

6. Dermatological conditions like Atopic dermatitis, seborrheic dermatitis, lichen simplex chronicus

7. Hygiene or perfume spray

8. Occlusive dresses / tight jeans

9. Tight and hugging under wears

10. Infestations by scabies / pediculosis

Etiopathology – The scrotum is an area with remarkable permeability. It provides a unique percutaneous doorway for the entrance of drugs into the circulation and is thus uniquely susceptible to toxic and irritant agents [4].Allergic reactions of the male genital are most often acute. They are influenced by the dependent position, rich vascularity and looseness of the connective tissue in this area [1]. Further the occlusion in form of tight hugging under wears and followed by release of detergent remnants present in undergarments. The detergent works as an irritant to scrotal skin. Other contributory factors includes friction, maceration, overwashing leads to scrotal dermatitis [12, 13].Riboflavin and other Vit B complex deficiency occasionally produce scrotal dermatitis [9].

Clinical features – The Scrotal dermatitis may present itself as severe itching with burning sensation In Lichen simplex chronicus the scrotal skin shows thickening, hypo or hyper pigmentation[2].

Krishnan Ajay & Kar Sumit suggested the following classification[1] depending upon clinical features.

Type 1- Mild & acute type: In it there is severe burning and itching. Heals with mild desquamation after some days or weeks.

Type 2- Severe chronic dry: Scrotum looks bright red and hypopigmented with severe itching.

Type 3 –Chronic wet: Whole of scrotum and inner thighs become macerated with oozing Fetid odor and telangiectasia may present.

Type 4 -Ulcerated and edematous: The scrotal skin is edematous with fluid or pus discharge, associated with severe pain.

The majority of patients(57)in our study were young in age group of 15 to 44 years (67.1%) this is the age when most of the persons were wearing jeans, tight pants etc. also this is the age when the teenager ,students and young adult try various toiletries and perfumes.

In this study 42 % of patients belong to middle and high income group. These group usually have enough surplus money to spend on expensive jeans, toiletries, deodorant and perfume etc. In our study only 12 patients were having Diabetes as shown by blood sugar levels and HbA1C levels.

Jeans were regularly worn by 41 patients (48.2%). The pants were worn regularly by 30 patients (35.3%). The students and young men wear jeans most of the time, wearing the same jeans for days together without washing or drying. The jeans and tight synthetic pants act as occlusive dress preventing evaporation of moisture, increasing local temperature thereby making the environment conducive for growth of bacteria and fungus. It also facilitate transcutaneous absorption of irritants.

The jockey type of tight and hugging underwears were worn regularly by majority of patients 46 (54.1%) . these underwears covers scrotum all around and are constantly in contact with scrotal skin. Any remnant of detergent, feces & urine acts as an irritant to scrotal skin. In this study 26 patients (30.6%) were using antiseptic soaps (Dettol , Savlon , lifebuoy). These soap contains Chlorxylenol (Dettol) and Triclosan. Chlorxylenol or 4 chloro 3,5-dimethylphenol present in various commonly used antiseptics preparations and soaps is also an important cause of dermatitis of the scrotum[11]. It also causes the removal of normal microbial flora of the skin and facilitates the colonization by pathogenic groups[1]. Twenty patients (23.6%) were using antiseptics liquids either directly over area or mixing with water for bathing. Cetrimide is one of the most common cause of contact sensitivity [11]. Deodorants were used over the area by 17 patients (20%) . Irritant reactions can occur from fluorinated hydrocarbon propellants sprayed too close to the genitals.[15]

Surprisingly 3 patients were using V wash (vaginal Wash containing Lactic acid & having pH of 2.5) over the area . 2 patients were using highly irritant detergent bar for bathing. To treat itching combination creams containing steroids, antibiotics and antifungals were used by majority of patients 66 (75.6%). 35 patients (41.2%) were using antifungal creams over the scrotum. Since the inflamed skin has a higher permeability, the various over the counter products applied over the lesions further aggravate the condition[1].

Four patients had used Dithranol ointment which led to development of acute irritant erosive contact dermatitis over the scrotum and surrounding skin.

In this study mild to deep erythema was observed in majority of patients 54 (63.5%). Various grade of thickening in 51 patients (60%).

Superficial to deep painful ulceration were observed in 35 cases (41.2%), leading to difficulty in walking. 9 patients(10.6%) showed painful erosion with serous discharge.

Nodules are very common over genital areas in case of scabies . Scabies nodules in treated or untreated cases were found in 20 cases (23.5%). In a study by M. Kanka Prasad Rao Genital scabies was present in 18.33% of cases of nonvenereal dermatosis [7].

An intact skin barrier prevents the penetration of harmful substances into the skin. Irritants and allergens that stay on the skin surface and come into contact with the stratum corneum only do not harm the skin [8].

Associated Tenia cruris was present in 28 cases (32.9%).However presence of dermatophytes was demonstrated microscopically in 15 cases (17.6%) by skin scraping and KOH examination. Tenia cruris cases are very common but spread over the scrotum is rare. Decreased scrotal skin barrier function facilitating permeation of antifungal factors into the stratum corneum and decreased eccrine sweat secretion in the penile skin resulting in lowered skin hydration have been proposed as the mechanism of the relative resistance, but neither has any rigorous proof [14].

Acute and chronic contact / irritant dermatitis were observed in 38 patients (44.7%).Lichen simplex chronicus were diagnosed in 26 (30.6%) patients. In a study by Bhatia et al over cases of Neuro dermatitis scrotal involvement was present in 12% of cases [3].

15 patients were also having associated or only bacterial infections. In a study by Woskoff A et al it was found that Candida and Staphylococcus were most commonly involved [5].

All the patients were counselled and treated. Most of them were advised to change detergents, soaps, underwear etc. They were also advised not to use combinations creams and antiseptics soap/liquids. Mild steroid creams were given for short periods, in cases of Dermatitis and Lichen simplex chronicus (LSC) along with advice to shun itching. Sedating antihistamines were given at night in cases of LSC. All the patients improved with medicines and changing the toiletries and clothes. However, in 18(21.2) patients there were recurrence of symptoms within two months of completing the treatment.

Conclusion

Though scrotal dermatitis is a very common condition, still it is underreported and underrated condition. For successful treatment, apart from medicines, lifestyle changes are also required.

Source of Support – Nil

Conflict of Interest – None declared

Ethical Clearance- Taken from Institutional Ethics Committee

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Health Status of Children in Assam

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Abstract

Children are the most valuable asset of a nation; their good health is the cornerstone for survival and development for current and succeeding generations which guarantee the sound and sustained economic development. Child health is a state of social, emotional, intellectual, mental and physical well- being which does not merely represent the absence of disease or infirmity. The term nutrition refers to a process of attaining necessary food for proper health and growth of human being. The nutritional status of children impacts their health, cognition and educational achievements. But underweight and malnutrition are most prominent health indicators in India and also in Assam (According to NFHS-3 & NFHS-4). Assam is situated in the North-East of India, bearing a considerable percentage of its population under the poverty line. Assam does not have shown much improvement in its health and nutrition indicators. Almost 36.4 percent children under age 5 are stunted and Infant Mortality Rate as high as 48(NFHS-4). The health status of children in rural areas of Assam is very pathetic. 55 percent children are stunting in rural areas. Various reports states that though Assam has made progress in its health indicators, still there is a great need to strengthen its existing health care services especially in the rural areas. The present study has made an attempt to study the health status of children in Assam. This study may be able to provide a base line information and need for effective implementation of various schemes and programmes for the improvement of health status of children in future.

Keywords: *Assam, Child, Economic Development, Health Care, Health Indicators, Nutrition.*

Introduction

Childhood is a significant phase of life and deprivation during this period can have long term adverse impact on the well being of children[1]. Child health is a state of social, emotional, intellectual, mental and physical well- being which does not merely represent the absence of disease or infirmity. The term nutrition refers to a process of attaining necessary food for proper health and growth of human being. According to World Health Organization (WHO), "Malnutrition means the cellular imbalance between, supply of nutrients and energy and the body's demand for them to ensure growth, maintenance and specific functions.[2]"

Healthy children have the fullest potentialities to attain proper weight in relation to height and resistance to diseases. Thus, it may increase life expectancy and help human beings to enjoy life fully, may also increase work capacity that results in increased productivity of nation and it enhances economic growth and development. Assam is situated in the North-East of India, bearing a considerable percentage of its population under the poverty line. Assam does not have shown much improvement in its health and nutrition indicators. Almost 36.4 percent children under age 5 are stunted and Infant Mortality Rate as high as 48 (NFHS). Various research article and study has reported that children in the developing country are most vulnerable as 50 percent of all deaths were occurring during the first 5 years of life. Despite inclusive efforts for improving malnutrition like ICDS programme, malnutrition among children remains a significant problem in India as well as in Assam.

The most common method used to assess the health status of children is given by World Health Organization (WHO). WHO growth standard can be used to assess whether children are growing and developing. It can also be used to observe whether efforts to reduce child mortality and disease are effective. According to WHO, growth standard are:-

- If < -1 to > -2 Z-score implies Mild Malnutrition
- If < -2 to > -3 Z-score implies Moderate Malnutrition and

- If < -3 Z-score implies Severe Malnutrition

On the basis of the above growth standard, three common anthropometric indicators are used to measure the nutritional status are -

1. Height-for-age (HAZ). HAZ is used to denote "stunting"- or low height for age,

which is an indicator of chronic form of under-nutrition. It is caused by long-term

insufficient nutrition intake and frequent infections.

2. Weight-for-height (WHZ). WAZ or low weight corresponding to height stands

for "wasting" or more acute or current form of under nutrition. It is a strong

predictor of mortality among children under five. It is usually the result of acute

significant food shortage or disease.

3. Weight-for-age (WAZ). The WHZ, low weight for age, is an indicator of chronic form of under-nutrition, denoting "under-weight."

Objective:

1. To study the health status of children in Assam.

Methodology

The present study is based on the secondary data that are collected from different government reports and organizations. The sources of secondary data are:-

i. The Department of Social Welfare, Government of Assam;

ii. National Family Health Survey -3 (NFHS-3)

iii. National Family Health Survey - 4 (NFHS-4)

iv. Census reports, Govt. of India.

v. Health and family welfare reports.

vi. Statistical Handbook of Govt. of Assam.

vii. Nutrition Policy reports of Govt. of India, etc.

Results and Discussions

Assam happens to be one of the worst performers in reducing child's nutritional status. A scrutiny of the nutritional status of the children, the adults of tomorrow, is important to assess the wellbeing and health[3]. Detailed studies were prepared by NFHS-3 and NFHS-4 and the main findings shows that stunted rate is 46.5 percent, wasted rate is 13.7 percent, severely wasted rate is 4.0 percent and underweight rate is 36.4 percent. However, according to NFHS-4, stunted rate has reduced to 36.4 percent and underweight rate also reduced to 29.8 percent. On the other hand, wasted rate and severely wasted rate has increased to 17.0percent and 6.2 percent respectively. Again in Assam, the infant mortality rate and under 5 mortality rates is 48 and 56 respectively which is 66 and 84[4].

The following table shows the percentage of malnourished children in Assam –

Table-1: Child Malnutrition Status in Assam

ASSAM		
INDICATORS	**NFHS-3 (2005-6)**	**NFHS-4(2015-16)**
Stunted	46.5	36.4
Wasted	13.7	17.0
Severely Wasted	4.0	6.2
Under-weight	36.4	29.8
Infant Mortality Rate	66	48
Under Five Mortality Rate	84	56

Source: NFHS - 3 & NFHS - 4

In Assam, the percentage of stunted children has decreased from 46.5 percent to 36.4 percent whereas wasted and severely wasted children are increased from 13.5 percent to 17 percent and 4 percent to 6.2 percent respectively. But the percentage of underweight children has reduced from 36.4 percent to 29.8 percent.

The district wise nutritional status of children in Assam is shown in table 1.2. It can be seen from table 1.2 that that Dhubri district has the highest number of

"stunting" children with 47.4 per cent. Goalpara district has the highest number of "under-weight" children with 39.5 per cent. Cachar district on the other hand, has the highest number of "wasting" children with 30.6 per cent.

Table 2: Child Nutritional Status in Various Districts of Assam (In percentage)

District	Stunted	Wasted	Severely Wasted	Under Weight
KOKRAJHAR	30.6	15.7	6.1	27.1
DHUBRI	47.4	22.2	9.5	39.0
GOALPARA	42.7	22.1	8.9	39.5
BARPETA	41.7	16.6	5.8	33.1
MARIGAON	38.4	10.3	0.9	25.8
NAGAON	38.4	13.3	4.4	31.3
SONITPUR	28.7	21.5	10.9	26.9
LAKHIMPUR	29.3	11.2	4.4	24.2
DHEMAJI	35.5	6.2	0.8	15.8
TINSUKIA	36.0	14.8	2.2	32.7
DIBRUGARH	33.3	22.4	8.2	33.0
SIVSAGAR	35.5	8.3	1.5	22.2
JORHAT	25.5	14.8	5.4	18.1
GOLAGHAT	32.6	13.9	6.5	20.2
KARBI ANGLONG	28.1	18.7	11.0	23.7
DIMA HASAO	34.7	6.3	1.3	18.2
CACHAR	36.3	30.6	11.3	36.3
KARIMGANJ	42.3	17.6	6.1	35.6
HAILAKANDI	38.1	19.1	6.3	32.5
BONGAIGAON	39.1	23.6	12.7	32.9
CHIRANG	40.1	13.0	4.4	24.7
KAMRUP (R)	33.3	18.8	5.3	29.6
KAMRUP (M)	24.6	11.0	2.4	23.2
NALBARI	26.8	15.3	6.2	20.0
BAKSA	32.4	10.5	2.7	22.4
DARRANG	43.5	19.2	5.3	37.9
UDALGURI	39.1	18.3	8.1	31.8

Source: NFHS-4

If we look at the table of health status of children of Assam in the geographical diversity category, it was found that the number of "stunting" children is highest in general area (66.1 per cent) followed by Char areas (61.8 per cent). According to the Human Development Reports (HDR) Assam- 2014, the multiple diversity areas and border areas are more vulnerable to "under-weight" and "wasting" children. Number of wasting and under-weight children is highest in multiple diversity

areas (24.6 percent and 45.8 per cent) followed by border areas (22.3 percent and 39.8 per cent). The following table shows the health status of children according to geographical diversity-

Table-3: Health Status of Children in Geographically Diverse Area of Assam

GEOGRAPHICAL DIVERSITY	STUNTING	WASTING	UNDERWEIGHT
Char areas	61.8	14.7	37.9
Flood affected areas	49.7	17.3	33.7
Hills	36.6	4.9	28.3
Tea-garden area	46.8	18.2	33.6
Border areas	47.8	22.3	39.8
Multiple diversity	55.1	24.6	45.8
General	66.1	12.6	37.7

Source: Assam HDR, 2014

The HDR Assam-2014 studied the male-female break up regarding the nutritional status of children under age five and it was found that 55 per cent male children against 52.9 per cent female children are "stunting", 17.7 per cent male against 16.1 per cent is "wasting", 39 per cent male children against 35.7 per cent female children are "under-weight." Again, the rural-urban break up has shown that 55 per cent rural children against 44.3 percent urban children are "stunting"; 17.1 per cent rural children against 15.6 urban children are "wasting" and 38.2 rural children against 30.4 urban children are "under-weight." The following table shows male-female and rural-urban break up in the three category of nutritional status of children in Assam:-

Table - 4: Malnutrition in Assam

ATTRIBUTORS	**STUNTING**	**WASTING**	**UNDERWEIGHT**
Male	55	17.7	39
Female	52.9	16.1	35.7
Rural	55	17.1	38.2
Urban	44.3	15.6	3.4

Sour Source: Assam HDR, 2014

Conclusion

From the above, we can conclude that Assam has made progress in its health indicators, but it is most urgent to strengthen its existing health care services especially in the rural areas. The percentage of proper nourished children in rural Assam is not very satisfactory. 55 percent children are stunting in rural areas. According to National Family Health Survey- 4, the health profile of Assam shows that about 29.8% children below the age of 5 years are underweight. Besides, 35.7% children between the age group of 6-59 months are anemic and about 25.7% women have body mass index (BMI) below normal. It indicates the state of acute malnutrition which may be attributed to lack of proper nutritious foods, illiteracy among parents, lack of proper sanitization facilities, irregular heath checkup, food scarcity and various socio economics factors that affect the nutritional status of children. Under National Rural Health Mission (NRHM) various quality development programme has been launched and under the Ministry of Social Welfare, ICDS programme has been introduced to facilitate regular health check-up, immunization, health education and other child health education programme.

Ethical Clearance: It is a review article.

Source of Fund: Self

Conflict of Interest: Nil

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Relationship of Character Strengths to Influence Psychological Well-Being During Adolescence

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Abstract

The primary research study examined the association and influence of VIA Character strengths on satisfaction, efficiency, sociability, mental health, interpersonal relations and above all the overall well- being. Research showed that (for n=300 adolescents who participated in the study), several character strengths (e.g., self-regulation, prudence, honesty, social intelligence, hope, courage and curiosity) are highly significantly positively correlated with measures of subjective well-being and its overall formation. Acknowledgment of the requirement for programs for positive youth advancement makes the evaluation and improvement of character qualities an exceptionally significant exercise in the present situation. An investigation of character qualities and their applications during adolescence period along these lines expect high significance because of its suggestions for prosperity of the young generation just as for psychological overall well-being advancement. In the above setting, the present examination of the profile of character qualities in Indian adolescent's as planned revealed featuring qualities that are most supported by them to advance well-being and bring prosperity.

Keywords: *character strengths, well-being, adolescence, satisfaction, mental health, positive psychology*

Introduction

At the point when parents, guardians and teachers talk about the characteristics they most would like to develop in children, they frequently notice character qualities such as, honesty, prudence, teamwork, love of learning.[1]These ethical characteristics are esteemed in their own right, despite the fact that they are additionally accountable to profit society and the people who have them. We expect that youngsters who build up these characteristics will add to society and have satisfying lives. Ongoing examination in positive brain research demonstrates that many character qualities are related with momentum levels of prosperity.[2] Only a few researches look at whether character qualities anticipate or advance future prosperity, nonetheless. The significant discussion was to look at whether character qualities foresee consequent prosperity during pre-adulthood. Character qualities are impacted by family, network, environmental, cultural, and other relevant elements. From a certain perspective, character qualities are pliant; they can be educated and obtained through training. There are numerous courses through which character qualities could advance positive results and avoid psychopathology. For instance, coordinated qualities may create situations of friendships and increment the social help individuals get from others, which thusly could expand positive encounters that lead to enjoyment, harmony, satisfaction and mental health. Numerous examinations have analyzed co-relationship and indicators of subjective wellbeing in grown-ups, yet there is less research on emotional prosperity, especially positive records of prosperity and its indices, in young children's. [3&4] The study investigates whether young people's character qualities toward the middle school would foresee their downturn, bliss, and life fulfillment. Research suggests that building character strengths can increase well-being. For example, interventions that promote social intelligence and self-regulation can reduce substance abuse, aggression and other behavioral problems among children, and increase the likelihood that youth will graduate from school.[5&6]

The primary reason for this investigation was to look at whether character qualities relate and foresee mental prosperity during youthfulness. We inspected whether adolescents' character qualities toward the middle school would foresee their satisfaction, efficiency, sociability, mental health and interpersonal relations;

joined together their abstract prosperity. Character qualities are the subset of personality attributes that are ethically esteemed. Like other personality attributes, character qualities are airs that show in individuals' musings, feelings and practices. [4,7&8]Demeanor, nature and personality styles may encourage qualities and facilitate strengths. For instance, personality styles, such as, amiability and approach (rather than withdrawal) may encourage character qualities, such as, kindness and courage. Though demeanor, nature and personality styles are not ethically esteemed, be that as it may, character qualities have an ethical importance and the vast majority of these characteristics are esteemed crosswise over societies and from the beginning of time.[9]Psychological well-being alludes to individuals' cognitive and enthusiastic assessments of their lives. It incorporates decisions eg. life fulfillment, pleasance feelings and less unsavory passionate encounters like discouragement.[10]As we learn we create inward qualities and qualities which furnish us with a solid inner locus of control and assembles our confidence. Studies have demonstrated that youngsters who experience a more significant level of emotional prosperity have improved inward locus of control. It has been said that adolescence is the time of "growing up" and early adulthood is the ideal opportunity for "settling down".

Materials and Method

Participants and Procedure

This study examined the profile of character strengths and well-being of adolescents enrolled in a school in National Capital Region of India and who participated in a psychological study for middle school students. The data was obtained from 300 adolescents, 100 each from class 6, class 7 and class 8, further comprising 50 boys and 50 girls from each grade class. This study was approved by the school board of the participating school. Students are represented by various regional, religious, cultural, environmental differences. In general, it was ensured that student participation depends on the availability of permission from parents and the sole interest of the student to participate. All the participants and their parents/ guardians were informed about the purpose of the study and were enrolled after obtaining their written informed consent. The questionnaires were mostly administered in groups of sizes varying between 10 and 30, under the supervision of the research staff.

Measures

The Values in Action Inventory (VIA) Classification describes 24 Character strengths that are thought to be the fundamental building blocks of character. These building blocks are universally considered to be qualities that define and lead people being their best. Character strengths are defined as capacities for thinking, feeling and behaving. Every person possesses each of these 24 Character strengths in different degrees, resulting in unique profiles that constitute the rich array of human personalities we observe. Adolescents completed the Revised Values in Action Inventory of Strengths for Youth (VIA Youth; Park & Peterson, 2006), designed for young people (ages 10–17). The questionnaire consists of 198 items that adolescent's rate on a Likert scale ranging from 1 ('Not like me at all') to 5 ('Very much like me'). Sample items on the VIA-Youth include 'I often tell my friends and family members that I love them' (love), 'I am very careful at whatever I do' (prudence),and 'I like to tell jokes or funny stories' (humor). The VIA Youth strength scales have been standardized and justified for the Indian adolescents under study demonstrated good internal consistency (with Cronbach alpha 's ranging from 0.72 to 0.93)

The psychological Well-being (PWB) scale comprises of 50 statements developed by Dr. Devendra Singh Sisodia with a view to measure several aspects of well-being vis. Satisfaction, Efficiency, Sociability, Mental Health and Interpersonal Relations. All statements are of positive manner developed using Likert criteria wherein the ratings are described as 1 '(Strongly Disagree)' to 5 '(Strongly Agree)'.This scale is useful in a variety of research and applied settings such as quality of life index, a mental health status appraisal and a measure of psychotherapy outcome evaluation and a social indicator of measuring population changes in sense of well-being over time.

Statistics

Descriptive Analysis was used to summarize which direction whether Disagree or Agree targeted students representing the population under study, are concluding their opinions. Internal consistency was examined for scale and subscale's using Cronbach alpha. Due to the nature of the study and moreover since Likert scale is used for self-assessment of both character strength and well-being dimensions non-parametric correlation analysis was performed using Spearman's rho to explore

the strength of relationship between them.

Results

The current research was conducted to study subjective well-being and character strength among Indian youth. Internal consistency reliabilities and descriptive statistics for the study variables are presented in Table 1 and Table 2. The results of correlational examination are presented in Table 3. The self-assessment of VIA character strengths amongst adolescents revealed that topmost virtues are Humor, Fairness, Kindness, Perseverance and Love. Likewise, the bottom most virtues are found to be Prudence, Honesty, Self-Regulation, Forgiveness and Curiosity.

Findings state that the character strength measures vis. Prudence, Honesty, Self-Regulation, Forgiveness, Curiosity, Courage, Leadership, Social Intelligence, Humility, Teamwork, Hope, Judgment and Gratitude have a positive and significant correlation with satisfaction, efficiency, sociability, mental health, interpersonal relations and overall with the formation subjective well-being at 0.01 level. However, Perspective, Creativity and Appreciation of Beauty have a positive and significant correlation with fewer of the well-being measures. Opposing the dimensions Spirituality, Zest, Love of Learning, Humor, Fairness, Kindness, Perseverance and Love showed no relationship with subjective well-being and it's formative measures.

Table. 1: Reliability, Mean and SD of character strengths for adolescent school students (n=300), under study

Measure	N Items	Cronbach's Alpha (α)	M	SD
Prudence	8	.739	1.74	.59
Honesty	8	.733	1.77	.58
Self-Regulation	9	.744	1.83	.58
Forgiveness	7	.811	1.84	.68
Curiosity	8	.759	1.87	.61
Courage	8	.751	1.88	.62
Leadership	8	.791	1.94	.65
Social Intelligence	8	.747	1.95	.62
Humility	9	.841	1.99	.76
Teamwork	8	.831	2.00	.76
Perspective	8	.892	2.07	.94
Hope	8	.825	2.09	.75
Judgment	8	.861	2.13	.83
Gratitude	8	.878	2.18	.96
Creativity	8	.861	2.24	.93
Beauty	8	.790	2.35	.85
Spirituality	8	.805	2.47	.89
Zest	8	.771	2.60	.86
Love of Learning	8	.755	2.79	.83
Humor	9	.933	2.98	1.08
Fairness	9	.865	3.19	.98
Kindness	9	.815	3.39	.85
Perseverance	9	.740	3.59	.76
Love	9	.727	3.71	.68

Table. 2: Reliability, Mean and SD of Well-Being and it's measures for adolescent school students (n=300), under study

Measure Scale and Subscales	**N Items**	**Cronbach's Alpha (α)**	**M**	**SD**
Well Being	50	.923	1.99	.49
Satisfaction	10	.825	1.91	.62
Efficiency	10	.782	1.96	.59
Sociability	10	.708	2.02	.59
Mental Health	10	.651	2.03	.53
Interpersonal Relations	10	.690	2.00	.56

Table. 3: Correlation Examination using Spearman's rho of Character Strengths and Well Being for the adolescent school students (n = 300), under study

Character Strengths	**Well -Being**	**Satisfaction**	**Efficiency**	**Sociability**	**Mental Health**	**Interpersonal Relations**
Prudence	.579**	.508**	.581**	.483**	.303**	.290**
Honesty	.502**	.571**	.484**	.397**	.213**	.251**
Self-Regulation	.656**	.622**	.660**	.458**	.387**	.360**
Forgiveness	.587**	.506**	.581**	.420**	.366**	.305**
Curiosity	.665**	.783**	.640**	.487**	.313**	.273**
Courage	.469**	.551**	.400**	.405**	.287**	.156**
Leadership	.632**	.979**	.594**	.309**	.239**	.302**
Social Intelligence	.682**	.730**	.655**	.526**	.312**	.350**
Humility	.588**	.511**	.560**	.504**	.269**	.353**
Teamwork	.560**	.375**	.485**	.547**	.338**	.326**
Perspective	.179**	.172**	.132*	.245**	.163**	.027
Hope	.548**	.768**	.579**	.279**	.222**	.259**
Judgment	.490**	.706**	.485**	.255**	.235**	.167**
Gratitude	.292**	.244**	.234**	.259**	.182**	.229**
Creativity	.154**	.219**	.165**	.092	.133*	.033
Beauty	.120*	.198**	.120*	.025	.104	.115*
Spirituality	.066	.109	.052	.036	.055	.059
Zest	-.006	.055	-.006	.005	.041	.019
Love of Learning	-.009	.064	.004	.064	-.003	.023
Humor	-.043	-.087	-.094	.072	.033	-.006
Fairness	-.085	-.115*	-.029	-.025	-.025	-.055
Kindness	-.141*	-.113	-.069	-.089	-.099	-.079
Perseverance	-.030	.016	-.027	.003	-.056	-.011
Love	-.147*	-.030	-.088	-.092	-.120*	-.112

** Correlations are significant at p< .01 level

* Correlations are significant at p< .05 level

Discussion

As far as we could possibly know, youthful to adulthood transition has been a sacked process in the formation stages of their character qualities. Recognizing the importance of its association with well-being, determining virtues that promote such developmental process is deemed significant and integral. Youthful adulthood might be described as the period that is set apart by solidification of one's personality on one hand and the accentuation on dominance of various ecological requests on the other. The developing acknowledgment of the requirement for programs for positive youth advancement makes the evaluation and improvement of character qualities an exceptionally significant exercise in the present situation. The positive youth improvement approach underlines on enabling youth to be the specialist of their own development with grown-ups propelling the revelation of their possibilities.[11] An investigation of character qualities and their applications during this period along these lines expect high significance, because of its suggestions for prosperity of the young, just as for psychological well-being advancement. In the above setting, the present examination as planned and determined for looking at the profile of character qualities in Indian youth, featuring the qualities that are most supported by them. Encounters containing positive feelings in this manner prompts higher life fulfillment. Diener (2000) clarified well-being as "peoples' evaluations that are both affective and cognitive".[12] In positive brain science (psychology), pleasure is communicated utilizing the term 'well-being' which is a multi-dimensional construct. Character strengths form the foundation where a person's personality that grows step by step with time. Previous researches expresses that high psychological well-being correlates with the absence of mental and social issues like state of mind issue and useless family connections, and such people are in every case better at critical thinking, execution at work, opposing pressure and more beneficial in contrast with others.[13&14]Utilizing correlational investigation, the present examination supported and found that psychological well-being is noticeable among youth. The finding can be credited to the formative parts of a person with respect to constructive mental development. Maturing is identical to development that prompts development. Development creates, with various encounters which people experience during their life span. Maturing is identical to development and is framed on a person's characteristic qualities.

Future Implications

Future research will recognize the systems by which the VIA character qualities increment well-being. Such research is probably going to have significant ramifications for intercession and counteractive action work. Implementing character strength development in turn well-being interventions and programs in the school curriculum not only increase subjective feelings of happiness among students, but also protect them against the negative effects of stress and the development of psychopathological problems.[1] &[15]Research has demonstrated that certain strengths of character are linked with increased life satisfaction, decreased psychopathology, fewer internalizing and externalizing behavior problems and academic achievement.[16] A promising approach to increase well-being among adolescents is through positive psychology interventions – that is, intentional activities that aim to cultivate positive feelings, behaviors, or cognitions.[17] Moreover, strengths can be clearly cultivated and strengthened through regular activity and application in life.[18]Along these lines, advancement of positive mental character qualities based interventions that can be used as a major aspect of the school educational plan is an auspicious interest.

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Dental Health Handbook as Parents Monitoring in the Formation of Independence for Brushing Teeth in Early Childhood

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Abstract

Oral health problems that many have encountered are dental caries and periodontal disease where the prevalence of dental caries of children aged 5-6 years by 93% with def-t index of 8.43. Such conditions do not meet the WHO target and FDI is 50% of children aged 5-6 years free of dental caries, it is because children are not capable of independent activity in brushing teeth. Proper behavior change strategies can be done by providing dental health education by parents. Dental health handbook could be a learning brushing teeth in efforts to establish the independence of brushing their teeth in early childhood. This study aims to effectiveness of dental health handbook as monitoring the parents in the formation of independence of brushing teeth in early childhood. Method: This study uses quasy experiment with pretest and posttest design with one group, by providing dental health guide books and training to parents. This research was conducted in PAUD Fatahillah Pangkalan Jati Depok. The independent variables: dental health guide books, variable between: knowledge and attitudes of parents and the dependent variable: the skills brushing teeth free of plaque and score early childhood. Data were tested using a paired sample test and wilcoxon. Result: the provision of dental health handbook effectively improve the knowledge and attitudes of parents ($p < 0.001$) and effectively to the improvement of skills brushing teeth and a decrease in plaque score ($p < 0.001$). Conclusion: effective dental health handbook as monitoring the parents in the formation of independence of brushing teeth in early childhood.

Keywords*: dental health handbook, independence brushing teeth, early childhood*

Introduction

Oral health is for general health, meaning that if someone toothache then general health will be disturbed. Oral health problems that many have encountered are dental caries and periodontal disease.[1-3]

Dental caries is a disease in hard tissue of teeth that is characterized by the breakdown of enamel and dentin caused by the metabolic activity of bacteria in plaque that causes demineralization. Dental caries if left untreated will cause periodontal infection. Bacteria periodontal pathogens are inflammatory mediators which then enter the bloodstream, causing systemic disease, such as: increasing the risk of heart attack, stroke risk, increase the severity of diabetes, respiratory diseases, preterm labor, rheumatoid arthritis, osteoporosis, pancreatic cancer, kidney disease and interfere with the system digestion, especially in children. Dental caries in preschool children is commonly known as early childhood caries, because the enamel of primary teeth is thinner than permanent teeth, so it is more susceptible to dental caries.[4-7]

Dental caries in Western Australian Aboriginal children aged 1-4 years especially preschool disease is number 5 of the disease to be treated from the hospital. According to Kwan in Santoso (2017), more than 50 million hours of school per year is lost as a result caused

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by toothache in children who have an impact until the life of an adult, meaning that dental caries in preschool years greatly affect the quality of life of children and growth.[8, 9]

Riskesdas in 2018 proved that the prevalence of dental health of children aged 5-6 years by 93% with def-t index of 8.43. Such conditions do not meet the WHO target and FDI is 50% of children aged 5-6 years free of dental caries.[9, 10]

One cause of the high prevalence of dental caries for dental health maintenance behaviors are less than the maximum, this is evidenced Indonesia's population had brushed his teeth with the categories of behavior really only reached 2.8% and by 2.8 West Java Province.[10, 11]Efforts to prevent the occurrence of dental caries can be done through the behavior of most major dental maintenance and recommended by way of brushing your teeth. That is the simple act of brushing teeth to remove plaque and food debris with a toothbrush and toothpaste, because plaque and leftover food is a major cause of dental caries, therefore it is necessary to build a habit of brushing their teeth at an early age.[12,13]

Early childhood is a "golden age period", meaning the golden period for all aspects of human development, whether physical, emotional and social cognition, where the development of intelligence in this period increased by 50%. Early childhood is the ideal time for a child's motor skills, including brushing teeth, so that will cause a sense of responsibility for the cleanliness of himself.[14]

Changes in a child's behavior depends on the ability of adaptation to the stimulus response beyond himself. It fits in the Roy adaptation theory (Sari et al, 2012) suggests that changes in a person's behavior depends on the incoming stimulus and adaptability of the person, that is to say through the right stimulus and the appropriate development of children, will help in entering the next phase of development is well. It is also affecting the child's behavior change is a stimulus from the environment, namely the involvement of family members. Through the active participation of parents it will be better the child's behavior in brushing teeth and guidance of parents in brushing teeth to prevent dental caries.[13, 15, 16]

Dental health guide books selected as the media for dental health education because it can accommodate writing and drawing in large numbers so as to help parents who have young children in maintaining their oral health. The use of guide books can also be motivated to instill a sense of responsibility for the maintenance of oral health of their children. This is evidenced research Darwis et al (2011) that the use of guide books can improve the status of early childhood dental hygiene.[17,18]

Based on this background, researchers interested in proving that the administration of dental health handbook as monitoring the parents in the formation of independence of brushing teeth in early childhood.

Method

The method used in this study is quasy experiment with the design of pre- and post-test with one group design. The experiment was conducted in PAUD Fatahillah Pangkalan Jati Depok during September and October 2019. Samples were taken with total sampling, as many as 46 students and 46 parents. The independent variable in this study are dental health handbook, the between variable is parents' dental health behavior (knowledge and attitude) and the dependent variable is the independence of brushing and plaque score early childhood.

Data collection knowledge and attitudes of parents measured the questionnaire with the following activities: pre-test, training and provision of health handbooks in the elderly and post-test. In early childhood intervention for 10 days with details of activities as follows: pre-test, intervention by parents and post-test measurement tool is a checklist sheet brushing and plaque index measurement sheets. The research data using a ratio scale statistical test, if normal data using a paired sample test, while not normal using wilcoxon test.

Results

Research result shows that the respondents to the age of 4 years as many as 4 children (8.7%), aged 5 years as many as 18 children (39.1%) and the age of 6 years sebnyak 24 children (52.2%). While respondents male sex as many as 18 children (39.1%) and female gender of respondents were 28 people (60.9%), he explained in the following table 1.

Table 1. Characteristics of respondents

No	Variables	Total	Percentage
1	Age		
	4 years	4	8.7
	5 years	18	39.1
	6 years	24	52.2
2	Gender		
	Male	18	39.1
	Femele	28	60.9

Table 2. The mean value of plaque index of children, knowledge and attitudes of parents

No	Variables	Mean	SD	Min-Max
1	Tooth brushing skills			
	Pre-test	4.37	1.142	3-7
	Post-test	8.48	1.110	6-10
2	Children's plaque index			
	Pre-test	36.22	10:50	12-60
	Post-test	26.83	9291	10-48
3	Knowledge parents			
	Pre-test	7:28	1.760	5-11
	Post-test	10:07	1.806	7-13
4	Attitude parents			
	Pre-test	36.41	8.798	25-35
	Post-test	50.33	9.031	55-65

Table 2 shows the average value of the value of the skills children brushing their teeth increased from 4.37 became 8.48. The value of the index on the child plaque scores decreased from 36.22 into 26.83. The average value of the knowledge of parents has increased from 7.28 into 10.07, and the average value of parents' attitudes also increased from 36.41 into 50.33.

Table 3. Test of normality

No	Variables	Pre-test	Post-test
1	Tooth brushing skills of child	0.000	0.001
2	Plaque index of child	0.184	0.067
3	Knowledge of parents	0.001	0.008
4	Attitude of parents	0.001	0.008

** Shapiro-Wilk*

Table 3 shows the results of the normality test for the plaque index score of children with normal distribution because the p-value >0.05 then proceed parametric test, while for the results of the child's teeth rub skills, knowledge and attitudes of parents are not normal distribution because the p-value of <0.05 so non-parametric test.

Table 4. Test the effectiveness of the knowledge and attitudes of parents and after intervention

Variables		Mean ± SD	P-value
Knowledge	Pre-test	7.28 + 1.760	0.001
	Post-test	10.07 + 1.806	
Attitude	Pre-test	36.41 + 8.798	0.001
	Post-test	50.33 + 9.031	

** Wilcoxon*

The results of the effectiveness test given knowledge before and after treatment showed that the p-value was 0.001 (p <0.05) means that the provision of dental health handbook effectively improve the knowledge of parents and the p-value the attitude of parents is 0.001 (p <0, 05) means that the provision of dental health handbook effectively improve the attitudes of parents.

Table 5. Test effectiveness skills brushing teeth plaque index scores before and after intervention

Variables		Mean ± SD	P-value
Tooth brushing skills *	Pre-test	4.37 + 1142	0001
	Post-test	8.48 + 1.110	
Plaque index **	Pre-test	36.22 + 10.50	0001
	Post-test	26.83 + 9.291	

** Wilcoxon ** Paired Sample Test*

The results of the effectiveness test of skills brushing teeth before and after treatment showed that given the p-value was 0.001 (p <0.05) means that the provision of dental health handbook in older people effectively improve the skills of early childhood brushing teeth and plaque index score of p- value is 0.001 (p <0.05) means that the provision of dental health handbook in older people effectively lower the score the plaque index in early childhood.

Discussions

Provision of dental health guide books and training to parents do to improve the knowledge and attitudes of parents in the maintenance of oral hygiene. According to Santoso (2017), is a dental health maintenance training activities planned through the learning process that aims to provide knowledge, inculcate and practice the skills until someone can independently perform maintenance actions oral hygiene.[9]

The result of the effectiveness of variable data and knowledge of dental health maintenance attitude of parents shows that the p-value 0.001 (P <0.05) means that dental health guide books effectively improve the knowledge and attitudes of parents in raising their children's oral health. Improved knowledge and attitudes caused by the guidebooks can be learned in time at any time, parents can actively learn independently so that the retention of material oral hygiene maintenance can easily catch. Health education is essentially a business activity or health messages to the community, group or individual. With the training given, respondents get the learning that results in a change from the previously unknown becomes known, the former did not understand being understood. This study is also consistent with the results of research Amin (2014) found a positive effect of dental health education to changes in values, attitudes and actions of parents to maintain their children's oral health.[19, 20]

Besides given a guide book, parents who have given their dental health maintenance training because then parents will be monitoring the activities of brushing teeth as efforts to establish the independence of children brushing their teeth. According Subekti (2017) assisting parents in toothbrushing influence behavioral change brushing and dental hygiene level of the child.[21]

The results of the effectiveness test the skills of data brushing teeth showed p-value was 0.001 (p <0.05), meaning that the provision of dental health guide books in older people brushing their teeth effectively improve the skills of early childhood. Intervention during 10 days of brushing teeth effectively improve the skills of young children because parents provide mentoring children in the learning process of brushing his teeth, parents and children directly involved in how to brush their teeth properly. This is in line with research Purnama (2019) mentoring brushing teeth for 10 days by a parent can shape the behavior of preschool children brushing their teeth. This success has also seen an increase in plaque

free scores of children. The results of the effectiveness test data indicate that the p-value was 0.001 ($p < 0.05$), meaning that the provision of dental health guide books to parents free of plaque effectively improve the scores of children. Score plaque free early childhood has increased since the sample has been taught to understand the practice to brush their teeth. Practice brush their teeth will be able to remove plaque. Research Raj (2013), proving that brushing your teeth with the correct technique will improve oral hygiene preschoolers.[22, 23]

Conclusions

Based on the results research, it can be concluded that:

1. Dental health handbook is effective in increasing knowledge of parents' oral health maintenance. This was proven significantly

2. Dental health handbook is effective in increasing the attitude of maintaining oral health of parents. This was proven significantly

3. Dental health handbook is effective as a monitoring for parents in the formation of independence in brushing teeth at early childhood. This was proven significantly

4. Dental health handbook is effective as monitoring of parents in reducing index plaque scores in early childhood. This was proven significantly

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Women's Mental Health in India: An Analysis through the Gender Lens

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Abstract

As opposed to the traditional biomedical view of health, the social model of health defines it essentially, as a positive concept which significantly hinges on and is impacted by the social settings, personality of the individual , as well as physical capacities.' It is in this context, mental health issues among women in general and Indian women in particular, as a subset of the larger corpus of health concerns needs to be inevitably understood and contextualised in the societal and cultural milieu within which women operate. One of such important societal constructs that seems to have a significant impact on mental and emotional health and experience of women is the the construct of gender and its corollaries like gender roles, expectations, demeanour, stereotypes etc. The social construct of gender engineers a woman's position in the social hierarchy and also has a prominent bearing on her social and personal life experiences. Consequently, socio-cultural context and gender need to be understood as powerful decisive factors of one's mental and emotional make-up that colludes with other variables like age, family, educational attainment, occupational structure, income and social support etc. The paper attempts to study the mental health concerns among women in India by especially, trying to locate its causes in the socio-cultural factors amid which the women live. Conclusively, the paper tries to highlight various suggestions for developing holistic solutions towards the improvement of mental health of women.

Keywords: *Mental health, gender, domestic violence, social model of health*

Introduction

The World Health Organization's Ottawa Charter for Health Promotion (1986) sees health as multidimensional and espouses a social model of health. It defines health as 'a positive concept emphasising social and personal resources, as well as physical capacities.' In the social model of health, while human biology, physiology and health care are considered as important elements, besides these, it incorporates within its purview a variety of other variables and factors that have the potential to impact the health of an individual. These factors range from social and cultural attributes, political environment, economic and financial factors, psycho-social factors to various other inter-personal and environmental factors as well as their reciprocal communications that might lead to health or illness. Therefore, the concept of health is definitely not unidimensional, it is multifaceted and involves multiple causal factors and similarly, the concept of women's mental health is no exception.

The inevitable foremost step towards sculpting a socially-rooted and contextualised model for improvement of women's mental health is figuring out a definition of mental health that can be usefully applied to women. The 1981 WHO report on the social dimensions of mental health, states that: ***'Mental health is the capacity of the individual, the group and the environment to interact with one another in ways that promote subjective well-being, the optimal development and use of mental abilities (cognitive, affective and relational), the achievement of individual and collective goals consistent with justice and the attainment and preservation of conditions of fundamental equality.'***

This definition is apt for a holistic understanding of women's mental health because it:

- emphasises the intricacies of mutuality and interrelations among a host of variables that that determine mental health and that the determinants of health function at multiple stages.

- looks and reaches beyond the 'biological' and 'individual' concedes the significance of the society and the 'social'

- Acknowledges the primal importance of values and principles of justice and equality in configuring mental and emotional well-being.

The social construct of gender engineers a woman's position in the social hierarchy and also has a prominent bearing on her social and personal life experiences. Consequently, socio-cultural context and gender need to be understood as powerful decisive factors of one's mental and emotional make-up that colludes with other variables like age, family, educational attainment, occupational structure, income and social support etc.

Objective and Method

The primary motive of the paper is to study the present scenario of women's health in India. This research paper whilst trying to enquire into the status of women's health, particularly, tries to understand and highlight the role of the contextual socio-cultural factors and gender constructs that operate in society; in serving as determinants of women's mental health. To this effect, a predominantly qualitative research approach has been adopted to critically inquire into the topic at hand. Data at all stages are secondary in nature and garnered from a variety of published sources. A thorough study of journal articles, newspaper and government health reports, books relevant to the topic has been undertaken. The methodology of data analysis is descriptive, explorative and analytical whereby observations, facts and ideas relating to women's mental health indices and conditions corresponding to the socio-cultural patterns and process of gender socialisation operating in the society are recorded and systematically presented in the prescribed format.

Findings and Discussions

The findings of the study have been presented and discussed in various sections dealing with various related observations and ideas. The first concrete finding of the study is the inevitable relationship shared by the social realities and indicators of women's mental health . The next section discusses exclusively the gender specific risk factors that have a significant bearing on women's mental health. The subsequent sections deal with mental health issues like prevalence of suicide among women with special emphasis on locating the socio-economic and gender identities and positionalities of women as a determinant. In the final analysis, on the basis of various suggestions as presented by credible health organisations and reports that might prove beneficial in improving mental health of women, a future roadmap to a holistic solution to the mental health crisis among women has been forwarded.

The Indian social reality and women's mental health

It has been evident that women in modern India face a paradoxical situation[1]. While women are increasingly making inroads into erstwhile male-dominated professions and admirably hiking up the corporate hierarchy, there is still a sizeable section of Indian women languishing without any sense of their identity or any form of human rights. Although, the government is striving hard to bring in women-centric legislations and devise policies for women empowerment and uplift, what is happening in ground reality remains unaffected; women still in a very large number and in variegated ways receive systemic discrimination in society. Patriarchy as the basis of India's social functioning operates within a web of norms that possess an inherent tendency to disempower and control women's every aspect of life. The women in India having to survive and grow up in such an environment and simultaneously having to do their best and live up to their own best potential as well society's expectations from her, proves to be a burdensome toil for all women throughout their life-cycle. This can often lead to emotionally explosive situations wherein women start experiencing mental health problems. Indian society is in an indecisive phase of passage from traditional to modernity, while new modern liberal values are being circulated and are afloat in the socio-cultural milieu, they have not been able to completely eradicate and displace certain old parochial traditional values that are endemically gender discriminatory; This kind of gender discrimination reinforces women's feeling of social disadvantage and further aggravates their psychological conditions[1].

Gender–specific risk factors featuring in women's mental health scenario

Gender plays an important role when it comes to deciding women's mental health. Gender also determines one's ability and capacity to avail various resources and facilitates. Self evaluation, self concept, self image, styles of interpersonal interactions, spirituality, mechanisms of

coping with stress, needs, expectations and all the other individual differences are, up to some extent determined by gender.

The mental health issues of women are a result various gender based risk factors like; violence, low income, income inequality, care giving responsibility, role stereotyping and etc. Mental disorders commonly seen in women are depression, anxiety, somatic complaints and eating disorders. The various atrocities faced by women like sexual violence, domestic violence and issues of multiple roles, overwork fairly contribute to mental disorders they suffer from, resulting in poor mental health. A positive correlation has been established between the scales of these social variables and the occurrence of mental disorders in women.. However, the taboos related to mental health issues and the differential treatment of genders stand as an obstacle in stimulating adequate mental health development and care amongst women.

Gender and Depression

"In 1977 Weissman and Klerman reviewed the evidence for differing rates of depression between the sexes, in the United States and elsewhere, during the previous forty years. They found that studies showed women experienced depression at rates much higher than men,"[12] The higher occurrence of depression in women cannot be solely attributed to biological factors. The social and culturally dictated mores and gender roles too have a part to play in propelling depression in women. The unequal power status cemented by the prevailing patriarchal social system has resulted in women reeling under a vicious circle of feminisation of poverty where women more often find themselves stuck in a state of economic deprivation inciting feelings of helplessness and hopelessness. Due to the advantages bestowed upon by globalisation and acceptance of liberal values, women now are able to make inroads into the public sphere breaking the patriarchal shackles ordaining them to relegate and confine themselves to the domestic sector only. While women are moving up the corporate ladder and marking their place in the public sphere, this does not necessarily entail that they have been liberated from the confines of domesticity. The perplexity reality is that the educated and working women today end up shouldering an excessive double burden of both work and domestic chores whisking away all of their personal time and energy, finally taking a toll on their emotional well-being. Additionally, gender crimes like sexual violence, domestic violence, eve-teasing , stalking which is a common occurrence in India cumulate to act as catalysts for mental diseases.

Women and suicide

There appears to be deeper connexion between gender and suicidal behaviour. Factors like childhood abuse, marital rape, domestic atrocities play a significant role in goading suicidal behaviour among women. A socio-cultural variable responsible for female suicide typical to Indian society is the practice of dowry in marriages. There are legislations in place that prohibit dowry dealings in marriages in India. In spite of this, the practice of dowry-related disputes still remains a leading cause of women's atrocities and death. Failure to meet dowry demands in many cases, leads the bride to be forced to commit suicide or even killed by the in-laws. "The precipitants for suicide, according to Indian government statistics, among women compared to men are as follows: Dowry disputes (2.9% versus 0.2%); love affairs (15.4% versus 10.9%); illegitimate pregnancies (10.3 versus 8.2); and quarrels with spouse or parents-in-law (10.3% versus 8.2%). The common causes for suicide in India are disturbed interpersonal relationships followed by psychiatric disorders and physical illnesses"[7].

Gender-violence

"According to an eye-opening United Nations report, around two-third of married women in India were victims of domestic violence and one incident of violence translated into women losing 7 working days in the country. Furthermore, as many as 70% of married women between the ages of 15 and 49 years are victims of beating, rape or coerced sex."[9] Female Indian psychiatric patients share a serious concern of sexual coercion. "Sexual coercion was reported by 30% of the 146 women in an Indian study. The most commonly reported experience was sexual intercourse involving threatened or actual physical force (reported by 14% of women), and the most commonly identified perpetrator was the woman's husband or intimate partner (15%), or a person in a position of authority in their community (10%)."[11]

Gender-based violence can cause untold sufferings and permanent damage to one's emotional and psychological well-being. Resultantly, women as victims of violence, suffer from emotions despondence and

stress, post-traumatic stress disorders, fertility problems and other variants of psychosomatic diseases etc

Suggestions for promotion of mental health among women

Women make up half of the human resource repository in India. Therefore, ensuring good mental health and emotional well-being of the women is quintessential to the country's progress and development. As we have been discussing, societal impositions, expectations, bindings, control, gender roles and stereotypes in Indian society impacts significantly on the emotional and mental well-being of a woman throughout her life-cycle- as a young girl, teenager, adult, married woman, mother and also as an older woman. Therefore, it is very important to undertake efficient intervention and assistive strategies to promote and sustain women's mental health under the prevailing social conditions.

Various suggestions for a preventive, protective, remedial and promotional framework for women's health in India can be advocated as follows:

- constructing evidence-based knowledge on the causative factors and extant of women's mental health issues as well as on the interceding and defensive factors. ;
- Policy stage interventions to efficiently sculpt policies that are sensitive and responds to women's mental health needs from childhood to old age and take steps for speedy and effective implementation.
- Calibrate and strengthen the capacities of primary healthcare providers enabling them to address and cure mental health consequences in victims of domestic violence, abuse, sexual assault.
- Promoting action research initiatives in the field of women's mental health.
- Promoting awareness of mental health issues and its curability among women to de-emphasise and eradicate its taboo nature in Indian society.
- Disseminating useful information of health care services and legal consequences and the various rights available to women against evils of rapes, sexual assault, domestic violence, stalking and other such crimes.
- "collaborating with international agencies and organizations to reduce/eliminate intimate partner and sexual violence globally."[10]

The health care services available to women need to gender sensitive taking cognisance of the special needs of women in terms of the differential social roles they play along. Gender-mainstreaming in health care services is a pre-requisite for offering timely and effective remedies against women's mental health concerns.

Conclusion

Therefore, it has been made inarguably clear that women's mental health is not a lone impervious variable, it has to be considered in association with their socio-cultural context and gender roles . Any policy or mere discussion on women's health concern should involve her emotional and mental well-being along with her physical health at all stages of her life. It is a common occurrence where policies in India view women's health very narrowly in terms of reproductive and maternal health solely. Such a constricted policy worldview in India has greatly contributed towards reinforcing the idea that women only exist as mothers and procreators. Moreover, when an individual woman suffering from a certain mental health concern is focused in isolation as a singular independent biological entity divorcing her condition from her sociological realities, it runs a risk of placing the burden of reformation on the women alone. But as we would agree that change for women is well beyond their control and is possible only with a bigger positive social transformation. Given these realities, it becomes imperative to undertake stratagems and schemes that would target the social factors responsible for having a degrading impact on women's health. Such strategies may involves social policies to reduce gender gaps in all fields of social existence, enhance women's status in society by giving them their due or at least empower and educate them enough that they are able to voice out their demands and grasp their rights for themselves. Although a large portion of the responsibility of change lies on the policy makers but women in India too must speak up to bring about the change they want in their lives. There are ample instances where women have taken on a social-acvitist vesture to fight off their own devils, for instance, the anti-arrack movement in Andhra Pradesh where they fruitfully succeeded in fighting off liquor addiction in their husbands and wife battering. Movements on the same line for fighting evils of sexual abuse, rape etc can go a long way in remedying the unjust social circumstances under which women live in India. "In summary, concerted efforts at social, political, economic, and legal levels can bring change in the lives

of Indian women and contribute to the improvement of the mental health of these women."[4]

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Ethical Clearance: Data has been collected from medical journals, books, newspaper reports and WHO databases and reports which is related to the topic of women's mental health.

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Transmission of Actinobacillus Actinomycetemcomitans & Porphyromonas Gingivalis in Periodontal Diseases

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Abstract

Periodontitis is one of the most common bacterial infections in humans. The disease is a consequence of destructive host immune responses to pathogenic bacterial species resulting from the dysbiosis of oral microbiota. Criteria for defining periodontal pathogens have been developed and include association, elimination, host response, virulence factors, animal studies and risk assessment. The bacteria associated with periodontal diseases are predominantly gram-negative anaerobic bacteria and may include A. actinomycetemcomitans, P. gingivalis, P. intermedia, B. forsythus, C. rectus, E. nodatum, P. micros, S. intermedius and Treponema sp. The bacterial numbers associated with disease are up to 10(5) times larger than those associated with health. The transmission of A. actinomycetemcomitans and P. gingivalis is discussed in this article.

Keywords: *Transmission, bacteria, A. actinomycetemcomitans, P. gingivalis, periodontal disease.*

Introduction

Bacteria inhabit the oral cavity in various concentrations. They colonize the soft tissues including the gingiva, cheeks, tongue and in the presence of teeth, bacteria colonize them both supra and sub gingivally. It is estimated that between 300-400 different species can colonize the oral cavity and an individual may typically harbor 150-200 different species. In the subgingival areas, bacterial concentrations range from about 10^3 in healthy shallow sulci to $>10^8$ in deep periodontal pockets. Among these microorganisms, about ten to 80 different species are capable of inducing or initiating periodontal disease.

The healthy and diseased clinical areas have been examined for the presence of microorganisms. Many researches have been done in this regard. It was found that in clinically healthy sites, streptococci, facultative species of Actinomycetes [esp. A.*viscosus* & A. *naeslundi*], Rothia *dentocariosa* account for about 85% of the total cultivable flora. Small proportions of gram-negative species including Prevotella *intermedia*, Fusobacterium *nucleatum*, Capnocytophaga, Niesseria and Veillonella species are also found most frequently in the subgingival areas. Microscopic studies prove the presence of a few spirochetes and motile rods in these diseased areas. The ratio of non-motile forms to motile forms in health is 40:1.

Periodontal disease has been proved to have a complex etiology. When the microbial etiology is concerned, the obligatory anaerobic species Porphyromonas *gingivalis* (**P*g***), Prevotella *intermedia* and Peptostreptococcus *micros* and the facultatively anaerobic species Actinobacillus *actinomycetemcomitans* (**A*a***) and Campylobacter *rectus* are regarded as principal periodontal pathogens today. Most individuals have acquired strains of suspected periodontal pathogens at some time in their lives which may or may not lead to periodontal disease. The progress of the disease depends on the resistance offered by the host. It has been quoted that the subgingival species found in humans are unique to that environment.

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Transmission of periodontal pathogens occurs through various means which are to be discussed in this article. The typical pattern requires the transmission of periodontal pathogens from the oral cavity of one individual to the oral cavity of another. A major focus of this article is to provide a critical review of selected studies on the transmission of A. actinomycetemcomitans and P. gingivalis which are the prime periodontal pathogens of a chronic periodontitis. The information may be used in the future to decrease the susceptibility to oral infection by A. actinomycetemcomitans and P. gingivalis and to arrest transmission of these pathogens to uninfected individuals.

Transmission of Periodontal Microbes

During recent decades, it has become evident that gingivitis and chronic periodontitis are the most common form of periodontal diseases seen in the population. This might be due to various reason including hereditary, habits, oral hygiene maintenance, susceptibility to infections and the presence of systemic diseases. Apart from this, environmental factors have been documented to influence the development of periodontitis. Besides plaque, it is proposed that the development of periodontal disease and its severity depends on the presence of a critical number of more putative periodontal pathogens. It is well established that periodontal pathogens cluster in families. This suggests that bacteria are transmitted between family members or that family members share susceptibility to colonization by these bacteria. Keeping the above statement in mind, two types of transmission are recognized including vertical transmission between parents and children[2,4] and horizontal transmission between siblings and between spouses. The latter may have consequences for the periodontal condition of a subject who marries a periodontitis patient harboring A. actinomycetemcomitans and P. gingivalis. If the spouse has poor oral hygiene and gingivitis, transmission of these bacteria may lead to conversion of gingivitis to periodontitis. This hypothesis is supported by the results of a recent study, which showed that spouses of severe periodontitis patients had a worse periodontal condition in comparison to spouses of periodontally healthy subjects.[9]

Techniques to Study the Transmission of Pathogens:

The mechanism of transmission of microorganisms has been studied thoroughly for generations. Different concepts of periodontal disease progression had been hypothesized and data had been published about the same. Evidence for both forms of transmission has been provided using molecular epidemiology techniques like REA (Restriction Endonuclease Analysis), AP-PCR (Arbitrary Primer-Polymerase chain reaction), serotyping, ribotyping, etc. The DNA is cut with restriction endonucleases, run on agarose gel electrophoresis and the resulting fingerprint patterns are compared either directly or with the help of various DNA probes. Through DNA probing technique.

A. actinomycetemcomitans and P. gingivalis frequently occur as monoclonal infections in the oral cavity. Other periodontal bacteria may show extensive genetic diversity. It was found that nearly 67%-80% of Aa species and 75%-85% of Pg species from most infected people are monoclonal in nature.

Transmission of Actinobacillus Actinomycetemcomitans

Actinobacillus actinomycetumcomitans (Aa) is a gram- negative, facultative, capnophilic coccobacillus suggested as playing a key role in the pathogenesis of several forms of periodontal diseases. Its possible exogenous origin has also been discussed recently**.** The evidence pointing to Aa as an exogenous pathogen in humans indicates the importance of understanding its mechanism of transmission.

This bacterium and elevated serum antibody titers against it have been associated with periodontal diseases including prepubertal, juvenile and adult periodontitis and refractory cases. However, this bacterium can also be detected rather frequently in periodontally healthy teenagers and even in children with primary dentition. Aa. may belong to the normal oral microflora. The occasional recovery of the organism in low proportions of the flora from healthy gingival sites and in periodontally healthy individuals supports the view of the opportunistic nature of infections associated with Aa.

Aa is acquired early in life from one or the other parent and is less likely to colonize the subject after reaching a certain age. Transmission of Aa to an established flora may be difficult in a healthy person where protective immune mechanisms and microbial antagonistic process are intact. However, it is possible that once anti-infective therapy is instituted, a new microbial ecology may be established in the oral cavity, which will more easily allow transmission of Aa.

When the resistance offered by the host decreases, bacterial transmission happens at a faster pace. It results from a combination of a sufficiently large and concentrated inoculum of the bacterial species enabling its survival during colonization, combined along with the environment where the recipient's macro and microenvironment accepts the intrusion of an microorganism; or in other words, the intruding microorganism evades the host defense and proceeds to infect the organism. These factors are again dependent on the behavioral patterns of the family members (i.e.) hygiene, proximity and differences in these practices among different family members. Therefore, theoretically any combination of acquisition or transmission between spouses and between parents and children exists. There are phases like periods of stress, when adults are more susceptible to bacterial infections, and when local changes promote the acquisition of the disease-causing bacterium because of decreased resistance, which enables bacterial transmission to occur.

Disease progression is most commonly seen in populations with low socio economic and educational levels as they in general maintain lower standards of oral hygiene as sprove din study by Preus *et al* (1994) and Tinoco *et al* 1988[7]. Although intra familial transmission of Aa has been demonstrated by Zamben *et al* it appears likely that transmission of pathogens also occurs between unrelated individuals Socransky & Haffajee described the transmission of ANUG both within troops in trenches in world war I and in communities outside the war zone, after world war I. If such reports are accurate, then it appears that periodontal pathogens can be transmitted rather readily, perhaps even on casual contact. Thus, while there has been an intuitive feeling that the oral microbiota is relatively stable within an individual, it seems likely that new species or different clonal types of the same species can be introduced into an individual at various stages of his on her life. If the newly acquired strain is more virulent than the preexisting strain of that species, then a change in disease pattern could occur.

Transmission of Porphyromonas Gingivalis

Porphyromonas gingivalis (Pg) is a bacterial species, which is specifically associated with severe periodontitis lesion in adults. In subgingival areas harboring Pg, it often comprises a relatively large part of the microbial flora. In healthy sites and in gingivitis sites, the isolation frequency of this species is low. The microorganism is quite uncommon in children although it can be seen in children with aggressive type of periodontitis. It was demonstrated recently that chronic periodontitis patients can be infected with more than one clonal type of Pg. Most often only one clonal type has been recovered, suggesting that chronic periodontitis patients are in general colonized with one predominant clone of Pg. It is not clearly known whether periodontal break down in spouses favored the transmission of Pg or the transmission of Pg from the spouses had initiated the disease process or had an aggravating effect on the present status.[8]

In untreated periodontitis, an increasing prevalence of Pg with increasing age of the patients was found. Though transmission of Pg is not a common phenomenon, it is suggested that the suspected periodontal pathogen Pg can be transmitted between spouses. Further research will be necessary to determine whether spouses of periodontitis patients are at risk for getting periodontal destruction and delayed wound healing following surgical management, because of transmission of Pg[12].

Clinical Significance of Transmission

It is well known that Aa and Pg play a major role in the etiology of periodontal diseases. The transmission rate of Aa appeared to be 14 – 60 % and Pg is 30 – 75% of the bacterium positive spouses pair studied. A seven-year longitudinal study of the periodontal condition of young Indonesian couples who had been married for an average of ten years was conducted.[13] Results suggested that transmission of Aa and Pg were uncommon between spouses regarding the intimate cohabitee of several years. Based on the results, it was found that the transmission occurred more frequently but did not lead to persistent colonization or detectable levels of the organism. Also, it was found that bacterial colonization is host dependent and depends on the characteristics of the strain. The numbers of bacteria in the transfer inoculum were too low or exposure to infection occurred too rarely. Based on the study, it was inferred that the older or established microbiota did not easily accept new bacterial invaders. This result contrasts with those of Von Troil linden *et al* 1995[9] & Asikainen *et al* 1997[6] who found that spouses of patients with periodontitis had significantly more gingival suppuration, supra gingival and sub gingival calculus and deeper periodontal pockets than the spouses of patients without periodontitis. Therefore, it seems that not only were periodontal pathogens transmitted between the same spouses, but also the transmission resulted in periodontitis in the recipient spouse. This possibility

needs to be further analyzed and the prophylactic consequences still need to be determined.

Source of Pathogens & Route of Infection

In humans, the highest frequencies and levels of Aa and Pg are usually seen in periodontal pockets subgingivally, although the organisms can be recovered from supra gingival plaque, oral mucosal surfaces, dorsum of the tongue and pharynx. These two microorganisms play a major role in the initiation and progression of periodontal diseases. While Aa can colonize a healthy and clean oral cavity, Pg does not seem to colonize clean tooth surfaces but prefers sites showing inflammation due to poor oral hygiene and sites harboring gram positive dental plaque bacteria.

Saliva play a role in the prevention and transmission of periodontal diseases. It was found that high salivary levels of periodontal pathogens are seen in patients with advanced periodontitis and in relation to patients with initial periodontal destruction.[9] These findings underscore the potential of saliva as transmission vehicle of periodontal pathogens. The role of saliva as a transport vehicle has been supported by the findings that Aa and Pg could be cultured from salivary samples, which indicates that these bacteria are able to survive in saliva during transportation to a new host. It can be said that the higher their load in saliva, the greater their risk of colonization of the recipient. Therefore, the suppression of the pathogens in saliva may prevent this spread among individuals.

Summary & Conclusion

The periodontal disease is confirmed by a group of illnesses affecting the gingiva and dental support structures. They are caused by certain bacteria found in the bacterial plaque. These bacteria are essential to the onset of illness; however, there are predisposing factors in both the host and the microorganisms that will influence the pathogenesis of the illness. Periodontopathogenic bacterial microbiota is needed, but by itself, it is not enough to cause the illness, requiring the presence of a susceptible host.

Bacteria have been seen to play a leading role in the onset and subsequent development of these illnesses. Therefore, when it comes to treatment of these diseases, coadjuvant antimicrobial treatment will be needed, since we already know that scaling and root planing alone will be insufficient to eliminate the periodontal pathogens[14]. The bacteria associated with periodontal diseases are predominantly gram-negative anaerobic bacteria and may include A. actinomycetemcomitans, P. gingivalis, P. intermedia, B. forsythus, C. rectus, E. nodatum, P. micros, S. intermedius and Treponema sp. The bacterial numbers associated with disease are up to 10(5) times larger than those associated with health. Data on the rare presence of multiple Aa clones within a single person indicate that an additional Aa clone or replacement of a previous clone is difficult. This hypothesis is supported by the finding that fewer than half of the married couples in whom both spouses harbored Aa, shared identical Aa genotype[6]. While human subgingival plaque harbors more than 500 bacterial species, considerable research has shown that *Porphyromonas gingivalis*, a Gram-negative anaerobic bacterium, is the major etiologic agent which contributes to chronic periodontitis. This black-pigmented bacterium produces a myriad of virulence factors that cause destruction to periodontal tissues either directly or indirectly by modulating the host inflammatory response[15]. Chronic periodontal diseases involve major pathogens like Porphyromonas gingivalis, Treponema denticola, and Tannerella forsythia, which have an immune armoury that can circumvent host's immune surveillance to create and maintain an inflammatory mediator rich and toxic environment to grow and survive. A full understanding of the microbial factors, their pathogenicity as well as host factors are of the essential importance for pathogenesis of periodontal disease. In this way it could be possible to treat the periodontal patients adequately.

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Application of a Health Belief Model to Hypertension within Rural India

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Abstract

Cardiovascular diseases are the principal cause of mortality among adults across the globe as well as in India. Hypertension is one of the leading factors contributing to cardiovascular disease; and its prevalence rate in India is 23% among urban population and 22.6% among rural populations. Beliefs play a significant role in managing and controlling health problems and depend in part on knowledge about the illness or disease. The present study uses the Health Belief Model framework to enhance understanding of the relationships of health beliefs with knowledge, risk factors for hypertension and hypertension. The present study focused on a south western state of India from which a taluk with one of the lowest socio-economic ratings was identified. A total of 263 participants were selected by multi-stage random sampling technique. The measures for data collection were comprised of a demographic data sheet, the WHO Steps tool, a hypertension knowledge questionnaire, hypertension belief scale, and physical assessments. Results were analysed using descriptive statistics, Pearson correlation, Independent sample t test, and binary logistic regression. Findings revealed that health belief model constructs, perceived susceptibility, severity, benefits, barriers, cues to action, and self-efficacy were significantly correlated with hypertension knowledge. Further it was observed that the health belief construct perceived severity was correlated with a risk factor and there was no significant association found between health belief constructs perceived susceptibility, severity, benefits, barriers, cues to action, and self-efficacy and hypertension.

Key words: *Health beliefs, Hypertension, Knowledge, Rural, India*

Introduction

Changes in life style and economic progression lead to epidemiological health transition with high rates of adaptation to urbanization. The shift from communicable to non- communicable diseases in the disease spectrum is seen as one of the major consequences of economic progression. Globally there has been a gradual increase in the burden of non-communicable diseases. According to WHO [2], 67% of the 56 million deaths in 2012 were due to non-communicable diseases; among these, 46.2% were due to cardiovascular diseases. Hypertension ranks among the most salient risk factors for cardiovascular diseases. It is estimated that it affects more than one-third of adults aged 25 and above, and thus one billion people worldwide suffer from this disease and contribute to nearly 9.4 million deaths from cardiovascular diseases each year Further, it is estimated that 23 million cardiovascular deaths will occur due to hypertension by 2030 [3].

Hypertension is a public health problem that results in 1.1 million deaths every year in India. It is deemed to be conducive to 10.8% of all deaths and 4.6% of all disability-adjusted life years in India [4]. Gupta, Brahmbhatt, Sharma, & Halappanavar [5] reported that the prevalence of hypertension in India is 23% for urban and 22.6% among rural populations and is directly responsible for 42% of coronary heart disease deaths and 57% of all stroke deaths [6].

The Health Belief Model, Rosenstock [7] predicts health-related behaviours with four constructs of perception, namely susceptibility of the health problem, the severity of the health problem, benefits of taking action, and barriers to taking action. These four constructs account for the readiness to act by people. In addition to these four original constructs, another element which prompted action seemed necessary hence cue for action was subsequently added to the model [7]. Finally, self-efficacy, which is the belief in one's own ability to

complete a task successfully, was a recent addition to the model [8]. This was done to better connect the interpersonal challenges of changing unhealthy behaviours with the model. The model postulates that for an individual to avoid a disease, the person should believe that he/she is personally susceptible to it, the occurrence of the disease will have at least a moderate level of severity on some aspects of the individual's life, undertaking a particular action would be beneficial by reducing its severity, and the action would overcome the barriers such as cost, convenience, pain, or embarrassment [9]. Cues to action then act as a trigger for protective health behaviour. The cues can be internal like the bodily states of a person or external such as the impact of mass media. Lastly, the individual ought to have credence in his/her ability to complete an action with success. Newell, Modeste, Marshak, & Wilson [10] examined the role of beliefs in the prevention of hypertension; their findings have shown that there was a significant negative association between perceived severity and systolic or diastolic blood pressure. Self-efficacy was negatively associated with risk scores. Most respondents thought that adopting strategies to reduce the risk of hypertension was useful and believed that their self-efficacy could help in changing these behaviors. Rosenstock [7] reported that self-efficacy; perceived susceptibility and severity of an illness or disease are partly dependent on knowledge about the illness or disease.

Appropriate knowledge about hypertension and its related consequences can motivate individuals to modify their lifestyle, such as weight loss [11] , restricting alcohol consumption, engaging in regular exercise [12] and increased intake of fruits and vegetables [13] Individuals with little or no knowledge about hypertension will most likely believe that they are neither at risk of becoming hypertensive, nor will they believe hypertension to have emotional, social or medical consequences to themselves or others. Gammage & Klentrou [14] employed Health Belief Model to analyse the perceptions and behaviors surrounding osteoporosis, and he reported that persons of all ages lacked knowledge about osteoporosis; their knowledge and expertise to understand the risk factors, protective factors, and the insidious nature of osteoporosis which was related to reduced perceived vulnerability for osteoporosis and practices aiming at preventing osteoporosis, were inadequate [15].

While the health belief model has shown to help and explain behaviour related to hypertension among western populations, less is known about its applicability within a South Asian context. The model purports that an individual would need to believe that one was personally at risk of developing the disease to take appropriate preventive actions. Beliefs serve an integral part in determining the management and control of health problems and depend in part on knowledge about the illness or disease. Knowledge and perceived susceptibility to disease are considered as an important factors that change the behavior of individuals. [16]. The present study aims to enhance understanding of the relationships between health beliefs model constructs, knowledge, risk factors for hypertension and hypertension.

Method

This study utilized a cross-sectional survey to describe the relations between health belief model constructs (perceived susceptibility, perceived severity, cues to action, perceived benefits, perceived barriers, and self-efficacy), knowledge about hypertension, risk factors for hypertension, and hypertension.

Study Area and Sample:

The present study focused on a south western state of India. This community-based study was located in Jewargi taluk, which ranks 174th out of 175 taluks in the state of Karnataka on various socio-economic indicators [17]. Based on the 2011 Census data, there were 159 total number of villages in Jewargi taluk.

A multi-stage random sampling method was used to recruit 263 study participants. Initially, the researcher selected 3 villages randomly from Jewargi taluka by lottery method; after selecting the villages, a unique number was given to each household in the three villages and another random draw was made to select sample households. A final lottery process was conducted to select the study participant among those in the household who were 18 years or older. Of 318 selected individuals, 263 consented to participate in the study. The main reason given for non-participation was a busy work schedule. Ethical clearance to conduct the study was obtained from the department and permission to conduct the study was obtained from the district health officer and taluka health officer.

Measures:

Health Beliefs Model:

A six subscale measure developed by Robinson

[18] assessed the constructs within the Health Beliefs Model. Thirty-one items on a five-point Likert scale assess six subscales namely perceived susceptibility (4 items), perceived severity (5 items), cues to action (4 items), perceived benefits (7 items), perceived barriers (5 items), and self-efficacy (6 items). Subscale mean scores were calculated and inter-item reliability analyses were conducted. Alpha reliability scores for each subscale were as follows: perceived susceptibility 0.357, perceived severity 0.687, and cues to action 0.639, perceived benefits 0.81, perceived barriers 0.795, and self-efficacy 0.602. Sub-scales were created by calculating an average score.

Hypertension Knowledge: the level of knowledge regarding hypertension was explored by asking questions about the reasons (high salt intake, family history, obesity, smoking, alcohol intake, high fat diet, stress, physical inactivity and unknown reasons), consequences (stroke, heart disease, kidney problem, eye problems and diabetes) and preventive measures (reduce salt intake, reduce weight, reduce intake of fatty food, exercise regularly, start medicine, quit smoking, stop drinking alcohol and regular check-up) of high blood pressure and recorded all the responses from the participants. Response options are dichotomous (Yes/No) [19]. A single summed index score was calculated for knowledge of consequences, and knowledge of preventive measures.

Behavioural Risk Factor Index: The WHO Steps Tool [20] was used to assess behavioural risk factors, namely smoking, alcohol consumption, dietary behaviour, physical activity, and obesity. Obesity via a body mass index calculation was derived from height and weight measurements taken at the time of the interview by the researchers. Each risk factor was coded 0/1 to represent the presence of behaviour categorized by the Steps Tool, for example, being a current smoker, if physical activity less than WHO guidelines, if fruit and or vegetable consumption was lower than five servings/ day, and being obese. Subsequently, a risk factor index was created by summing up across factors.

Hypertension: Blood pressure was measured three times with a minimum of 5 minute rest period in between each reading; participants were in a sitting position with the measurement on their right arm and taken over loose clothing using a portable digital blood pressure device. Hypertension is defined as a systolic blood pressure 140 mm Hg or higher; or diastolic blood pressure 90 mm Hg for average of the three readings; the history of diagnosis of hypertension, or receiving antihypertensive medication and captured in a dichotomous coded variable.

Demographics: Six items were taken from the WHO Steps Tool [20] to assess age, gender, education, income, occupation, and marital status.

Data Collection:

The written questionnaire was first translated from English to Kannada which is the most popular language in Karnataka. Three research assistants trained by the principal investigator conducted the in-person structured interviews.

Data Analysis

All data were entered into SPSS 20th version. Initially scales were created and alpha reliability analyses completed. Descriptive statistics were performed along with correlations and independent sample t test to examine the relationships and assess the differences between scales. Lastly a binary logistic regression was conducted to examine the contribution of health belief model constructs and hypertension knowledge on hypertension status

Results

Table 1 shows comparison of demographic information between the hypertensive and non-hypertensive group. It was found from results that, 51.56% of males had belonged to hypertensive group forming majority in comparison to female (48.43%). Observing the demographic details of education qualification, participants who had no formal schooling (67.18%) had formed majority of hypertensive group, followed by participants, less than primary school (12.5%). Majority of the participants were daily wage labourers 28.12% followed by unemployed and unable to work 26.6% and self-employed 20.31% respectively in terms of their occupation levels. The married participants (78.12%) were majority in the category of hypertensive groups. Majority of the hypertensive were found to be of the age group of 46 and above (64.06%; $p< 0.001$) comparing based on the age group.

Table 2 shows Differences in Health Belief constructs between hypertensive and non- hypertensive. Using independent sample t test it was revealed that in the sub scales perceived susceptibility, severity cues to action and self-efficacy hypertensive group had higher

average score as compare to the non-hypertensive groups which indicates hypertensives have more perceived threat and readiness to action as compare to the non-hypertensives but in the subscale perceived barriers and benefits non hypertensive groups score higher average score which indicates non hypertensive groups were able to overcome barriers and perceive more benefits from healthy behaviour. Further there was no significant difference was found between hypertensive and non-hypertensives in all the subscales of health belief model

Table 3 shows the relationship between health belief constructs and the risk factors index. Perceived severity was positively correlated with the risk factor index (r= .156, $p<0.05$) suggesting that those participants categorized with more behavioural risk factors are related to higher perceived severity of the disease. Other health beliefs constructs were not significantly related to the risk factor index.

From table 4, it was observed that all of the belief sub-scales and knowledge index are significantly correlated with one another. All significant correlations are positive, in other words, the greater the beliefs the greater the knowledge with the exception of perceived barriers which was negatively significantly related with the other constructs of health belief scale.

Table 5 shows the association of health belief constructs, hypertension knowledge, and socio-demographics with hypertension. Findings revealed that preventive knowledge of hypertension and age significantly associated with the odds of hypertension (OR=1.96.; CI: 1.22-3.14) $p<0.05$ and (OR=1.02; CI 1.02-1.07) $p<0.01$ respectively. From the table it is observed that none of the health belief constructs perceived susceptibility, severity, benefits, barriers, cues to action, self-efficacy were significantly associated with odds of hypertension. The knowledge about reasons and consequences of hypertension efficacy were also not significantly associated with odds of hypertension.

Table 1 Comparison of demographic information between hypertensive and non-hypertensive

Demographic variable		**Non Hypertensive**	**Hypertensive**	**Total**	**df**	**p**
Gender	Male	90(45.22)	33(51.56)	123 (46.76)	1	0.23
	Female	109(54.77)	31(48.43)	140(53.23)		
Education	No Formal Schooling	122(61.30)	43(67.18)	165(62.73)	6	0.70
	Less than Primary	33(16.58)	8(12.5)	41(15.58)		
	School					
	Primary School	13(6.53)	3(4.68)	16(6.0)		
	Completed					
	Secondary School	1(0.5)	1(1.56)	2(0.76)		
	Completed					
	High School	12(60.30)	6(9.37)	18(6.84)		
	Completed					
	College/Graduation	17(8.54)	3(4.68)	20(7.60)		
	Completed					
	Post-Graduation and	1(0.5)	0(0)	1(0.38)		
	Above					

Cont... **Table 1: Comparison of demographic information between hypertensive and non-hypertensive**

Occupation	Government	2(1)	0(0)	2(0.76)	8	0.71
	Employee					
	Non-Government	3(1.5)	4(6.25)	7(2.66)		
	Employment					
	Self Employed	44(22.11)	13(20.31)	57(21.67)		
	Non Paid	6(3.0)	2(3.12)	8(3.04)		
	Student	5(5.12)	1(1.56)	6(2.28)		
	Home Maker	30(15.07)	7(10.93)	37(14.06)		
	Unemployed able to	4(0.20)	2(3.12)	6(2.28)		
	work					
	Unemployed unable to	24(12.06)	17(26.56)	41(15.58)		
	work					
	Daily wage labourer	81(40.70)	18(28.12)	99(37.64)		
Marital status	Never Married	18(9.04)	4(6.25)	22(8.36)	3	0.057
	Currently Married	168(84.42)	50(78.12)	218(82.88)		
	Separated	2(1)	0(0)	2(0.76)		
	Widowed	11(5.52)	10(15.62)	21(7.98)		
Age in	Age 18- 30	62(31.15)	8(12.5)	70(26.61)	2	0.001
	Age 31-45	65(32.66)	15(23.43)	80(30.410		
	Age 46 and above	72(36.18)	41(64.06)	123(46.76)		

Table 2: Differences in Health Belief subscales between hypertensive and non- hypertensive category

Health Belief Sub scales	**Hypertension status**	**M**	**SD**	**t**	**p**
Perceived Susceptibility	Non Hypertensive	3.36	0.49	1.81	0.239(NS)
	Hypertensive	3.45	0.58		
Perceived Severity	Non Hypertensive	3.64	0.45	1.03	0.303(NS)
	Hypertensive	3.71	0.4		
Cues to action	Non Hypertensive	1.77	0.81	1.07	0.282(NS)
	Hypertensive	1.9	0.85		
Perceived benefits	Non Hypertensive	3.58	0.36	1.14	0.252(NS)
	Hypertensive	3.52	0.34		
Perceived Barriers	Non Hypertensive	2.63	0.54	1.32	0.186(NS)
	Hypertensive	2.53	0.56		
Self-efficacy	Non Hypertensive	3.15	0.45	1.01	0.312(NS)
	Hypertensive	3.22	0.44		
NS= Not Significant					

Table 3 Relationship between Health belief Subscales and Risk Factor Index

Health Belief model subscale	Risk factor index (r)
Perceived Susceptibility	0.323
Perceived Severity	0.156*
Perceived benefits	0.032
Perceived barriers	-0.051
Cues to action	-0.116
Self-efficacy	0.032
*(p<0.05)	

Table 4: Relationship between Health Belief Subscales and hypertension Knowledge

	Variables	1	2	3	4	5	6	7	8	9
1	Perceived susceptibility	_								
2	Perceived severity	-0.012	_							
3	Perceived benefits	-0.069	.395**	_						
4	Perceived barriers	.251**	0.059	.213**	_					
5	Cues to action	.280**	0.122	.129*	.322**	_				
6	Perceived self efficacy	.135*	.190**	.249**	.172**	0.104	_			
7	Knowledge of reasons	.230**	.208**	.180**	.265**	.419**	.271**	_		
8	Knowledge of consequences	.135*	.313**	.424**	.243**	.263**	.291**	.643**	_	
9	Knowledge of preventive measures	.294**	.186**	.139*	.248**	.478**	.302**	.861**	.598**	_

Table 5 Logistic Regression of Health Beliefs and Knowledge Subscales and socio demographics with Hypertensive Status as Outcome

Variables	OR (95%CI)	p
Perceived Susceptibility	0.706 (.331 1.506)	0.36
Perceived Severity	1.389 (.435-4.437)	0.58
Perceived benefits	.288 (.073 1.139)	0.07
Perceived barriers	.738 (.337 -1.614)	0.44
Cues to action	1.212 (.715- 2.053)	0.47
Self-efficacy	1.410 (.560- 3.546)	0.46
Knowledge of Reasons	.632 (.388-1.030)	0.06
Knowledge of Consequences	1.433 (.905- 2.269)	0.12
Knowledge of Prevention	1.964 (1.226-3.148)	0.05
Sex	.994 (.466-2.117)	0.98
Age	1.049 (1.024-1.075)	0.01

Discussion

Hypertension is considered as a major public health problem in India leading 1.1 million deaths per year [4]. Literature suggests that health beliefs and knowledge have a vital role in the prevention and control of health conditions. There is a paucity of evidence examining these health constructs among rural Indian populations. The present study aimed at investigating relationships between health beliefs, knowledge related to hypertension, risk factors, and hypertensive status.

Health belief and Hypertension knowledge:

It was observed that all the health belief constructs and hypertension knowledge are significantly correlated with one another. All significant correlations are positive, in other words, the greater the beliefs the greater the knowledge with the exception of perceived barriers which was negatively significantly related to the other constructs. From the findings, it could be inferred that higher the knowledge the greater the perception of threat and taking preventive actions and minimizing barriers to follow healthy behaviours. Our findings are consistent with those reported by Rashrash, Maneno, Ettiene, & Daftary [21] to assess the relationship between Hepatitis C knowledge and health belief model constructs wherein they found that Hepatitis C Knowledge was positively correlated with perceived benefits and perceived severity. Similarly, Midi & Tsai [22] found that among South Asian women participants, who were unaware of osteoporosis did not consider themselves to be susceptible to it and did not consider osteoporosis to be a severe disease. Elsabagh, Aldeib, Atlam & Saied [23] reported osteoporosis knowledge was negatively correlated with barriers to calcium intake and barriers to exercise. On the other hand, there was a significant positive correlation between knowledge and the benefits of exercise with a higher knowledge level associated with positive beliefs of exercise benefits.

Health beliefs and Risk factors

From the findings it was observed that the health belief constructs, perceived susceptibility, benefits, barriers, cues to action, self-efficacy were not significantly correlated with risk factor index which is the sum of all the risk factors. Present study findings are in contradiction to the study conducted by Larki, Tahmasebi & Resisi [24] found that self- efficacy and perceived susceptibility were associated with holding on to low salt diet, making use of common weight management strategies, involving in physical activity, and not smoking in hypertensive patients. Similarly in another study conducted by Kamaran, Ahari, Biria, Malpour & Hyedri [25] reported that adhering to medicines decreases with lower perception of disease severity. These contradictory results might be due to the reason that, in the present study most of the participants 62.3% were with low health literacy, patients with low literacy tend to feel less confident in their capability to execute self-care behaviours and also may have less motivation for performing self-care tasks. Subsequently, it is required to increase confidence among uneducated people to select appropriate behaviours which help them to engage in healthy behaviours. The concept of perceived susceptibility was introduced by Dehghani-Taftiet.,al [26] as an pertinent component in behavioural change among diabetic patients.

To adopt self-care behaviour, health care providers need to involve themselves to increase the level of awareness about the hypertension and improve the proficiency to modify beliefs of the patients so that they accept that they were susceptibile to get these diseases.

Hence, providing awareness related to hypertension to persons with low level of information will help in developing beliefs to know the danger of high blood pressure which helps them to engage in healthy behaviours.

Health Beliefs, hypertension knowledge and hypertension:

Form the findings it was observed that the health belief constructs perceived susceptibility, severity, benefits, barriers, cues to action, self-efficacy were not significantly associated with odds of hypertension. As the findings show, health belief subscales were not associated with hypertension this may be due to the reason that constructs of health model alone is not sufficient to predict the hypertension, there might be some other factors such as socio-demographic characteristics, psychosocial factors, personal factors, and cultural beliefs all of which will have to be present to activate the beliefs and follow healthy behaviours [27 & 28].

Knowledge about reasons and consequences of hypertension were not associated with the odds of hypertension but the knowledge about preventive measures has been associated with the odds of hypertension. It could be attributed to the reason that,

the person who is diagnosed with the disease frequently visit to hospitals and try to get the knowledge about the preventive measures from doctors, nurses and family and friends this might have been raised the knowledge about the preventive measures of hypertension.

Conclusion

Findings of the present study indicate that strong correlations between health beliefs and knowledge of the hypertension. In the present study except perceived severity none of the health belief constructs correlated with the risk behaviours this might be due to the reason that in the present study most of the participants 62.67% were without formal schooling. Perhaps, the poor health literacy might have been the reason for the people to have less knowledge about hypertension and its complications. Finally, health belief constructs perceived susceptibility, severity, benefits, barriers, cues to action, self-efficacy have not been significantly associated with odds of hypertension this may be due to the reason that constructs of health belief model alone is not sufficient to manage the hypertension.

Limitation:

In the present study the values of perceived benefits and knowledge preventive measures are closer to the association but significant association was not found this might be due to small sample size. While the present study utilized a random sampling methodology on rural participants, its findings cannot be generalized outside its rural sample. The study may also have been under powered with its sample size particularly when the sub-categories of hypertensive and non-hypertensive participants were examined. The health belief subscale for susceptibility had a low alpha reliability though still was significantly related to the three knowledge subscales. Regardless this may have impacted its performance in the logistic regression model examining hypertension status. Overall these limitations to not over shadow the conclusions that were drawn from the study

Future direction

In the future study could be extended to the different parts of India including urban areas with more sample size. Future studies, should emphasize on other behaviour models with emphasis on socio-demographic characteristics, literacy, psychosocial factors, personal factors, and cultural beliefs.

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Clinico-Mycological Profile of Dermatophytosis in a Tertiary Care Hospital in North India

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Abstract

Introduction: - Dermatophytosiscomprise approximately 15- 75% of all the mycological infections. It is common in tropical and subtropical countries including India where high temperature and humidity play an important role in the pathogenesis. Dermatophytes are closely related keratinolytic fungi with the ability to degrade keratin and invade the skin, hair and nails causing dermatophytosis.

Objective: - To find out the distribution of various dermatophytefungi responsible for the different clinical types of dermatophyte infections.

Methods: - KOH mount were prepared from the skin scrapings, nail clippings, and hair bits to look for fungal elements. The specimens were also inoculated on Mycosal media and Sabourauds dextrose agar with chloramphenicol. The dermatophytes were identified on the basis of colony characteristics, lactophenol cotton blue mount, nutritional requirement, temperature tolerance, urease production, and in vitro hair perforation test.

Result: - A total of 245 patients were included in the study. Tinea corporis was most common clinical type with 102(41.6%) cases followed by T. facei[15 (6.1%)]. T. corporis +T. cruris [88(35.9%)] was most common mixed clinical type. Out of 245 patients, fungal hyphae were seen in 162(66.1%) samples and the rest 83(33.9%) were negative by KOH mount. In the 162 KOH positive samples, 151(91.5%) samples were culture positive and 11(13.7%) were culture negative. In 83(58.9%) KOH negative samples, 14(8.5%) were culture positive and rest 69(86.3%) were culture negative. A total of 165 samples were culture positive, of which T. mentagraphyteswas isolated in 153(92.7%) followed by T. rubrum in 5(3.03%), T. violaceum in 3(1.8%), T.tonsurans in 2(1.2%) and M.canis in 2(1.2%) samples.

Keyworgds:- *Dermatophytosis, Fungal Culture, Mycosal media, Taenia corporis, Trichophyton, Microsporum*

Introduction

Dermatophytosis is the term given to infections caused by dermatophytes; also called tinea according to the site of infection as for example tineacorporis involving the arms, trunk and legs, tineacapitis involving the scalp, and tineapedis involving the foot, etc. Dermatophytes are distributed into three closely related genera: Epidermophyton, Trichophyton and Microsporum. These fungi can be classified on the basis of their normal habitat: geophilic dermatophytes are naturally present in the soil, zoophilic in animals, and anthropophilic in humans.[1]

Zoophilic andanthropophilic dermatophytes evolved from a geophilic origin, with the anthropophilic dermatophytes being the most highly specialized

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groups. They seldom infect other animals and they are additionally limited to some body parts. Anthropophilic fungi are responsible for most superficial fungal infections. Transmission can happen by direct contact or from introduction to desquamated cells. Direct inoculation through breaks in the skin happens moreregularly in persons with depressed cell-mediated immunity. Once organism enter the skin, they germinate and invade the superficial skin layers.[2]

This infection is typicallynot life threatening, happens even in immunocompetent hosts, and in several cases is long lasting, recurrent and troublesome to cure. Superficial mycoses are among the most frequent types of human infections, being estimated to effect over 20-25% of the world's population, and their incidence is constantly increasing.[3,4]The distribution of dermatophyteinfectionsand their causative agents varies with geographical region and is influenced by a wide range of factors likeclimatic factors, lifestyle, migration of population, cultural practices,socioeconomic conditions, incidence of strange comorbidities and drug therapy.[4, 5]This study was therefore undertaken to find out the distribution of causative dermatophyte species from clinically suspected cases of dermatophytosis.

Material and Method

This Study was conducted in the Department Of Microbiology, SGT University, Gurgaon, Haryana and Muzaffarnagar Medical College and Hospital, Muzaffarnagar. The study was done from January 2017 to December 2018 over a time of a year.All consecutive cases of dermatophytosis were included in the study.

Specimen Collection

The patients who presented to the dermatology outpatient department with lesions on skin/ hair/ nails (vesicles, scaleson skin and nails and breakdown of hairs) suggestive of dermatophytosis were refered to the mycology laboratory where samples were collected from the patients.A total of 245 samples were collected, depending upon the site of infection, samples were:

- Skin scrapings
- Nail scrapings and clipping
- Hair plucking and scales scrapings

Cases of dermatophytosis with secondary bacterial infections and patients already on antifungal drug treatment were excluded from the study. Wet mount of different samples e.g., skin scrapings, hair and nail clipping were prepared using 10-20% KOH. This preparation was examined under the microscope to look for the presence of dermatophytic fungi which appear as thin branching fungal hyphae. The presence of fungal hyphae in clinical material was not enough to identify the organisms with certainty. Samples were culturedon Sabouraud's dextrose agar with chloramphenicol and Mycosel agar. Plates were incubated at 25^0C for up to 4 weeks. The characteristic features of the colony that were considered were rate of growth, texture, topography and color of the colony, and the production of pigment on the reverse of the colony. Microscopic morphology was examined by lacto phenol cotton blue mount of the colonies and Slide culture. Further identification of dermatophytes included:

- nutritional requirement (such as vitamin and amino acid utilization) on Bactotrichophyton agar
- temperature tolerance
- urease production
- In vitro hair perforation test.

Result: - A total of 245 samples were taken, of which 189 (77.1%) were from male patients and 56(22.9%) were from female patients. The commonest age group was 16-30 (59.2%) followed by 31-45 (19.6%), 46-60 (8.6%), <15(7.8%) and 61-75 (4.9%) years. (Table 1)

Table 1: Distribution of study population according to age and gender

Variables	Number	Percentage
Age (years)		
< 15	19	7.8
16-30	145	59.2
31-45	48	19.6
46-60	21	8.6
61-75	12	4.9
Sex		
Male	189	77.1
Female	56	22.9
Total	**245**	**100**

Out of 245 cases, T. corporis was commonest clinical type and was seen in 102(41.6%) patients. Maximum number of cases of T.corporis were seen in the age group of 16-30 years[61(59.8%)].T.corporis + T.cruris were the commonest mixed clinical type with 88(35.9%) cases; out of which 51(57.9%) caseswere in the age group 16-30 years. Second most common single clinical type seen was T. facei with 15 (6.1%) cases; followed by T.mannumin 7(2.9%) cases,T.cruris and T.ungiumin 5(2.04%) cases each, T. pedis and T. capitisin 3(1.2%) cases each.

Second commonest mixed clinical type seen was T.corporis+T.cruris+T.facei in 7(2.8%) patients; T.corporis+ T.facei was found in 5(2.04%) patients; T.corporis+T.cruris+T.mannum were found in 2(0.81%) patients. Rest of mixed clinical types, T.facei +T.mannum, T.corporis +T.pedis and T.facei+T.cruris was seen in 1(0.4%) patient each. Most of these infections were more common in 16-30 years age group except for T. pedis and T. capitis which were more common in <15 years age group.

In general Males were 3 times more commonly effected than females by almost all the Tinea infections except for T. ungium which was more common in females. Variance of clinical condition with sex was not found statistically significance. (Table 2)

Table 2: Association of clinical condition with gender

Clinical condition	Sex n (%)		Total (%)	p-value
	Male	Female		
T.corporis	77 (75.5)	25(24.5)	102(41.6)	0.593
T.facei	9(60)	6(40)	15(6.1)	
T.mannum	6(85.7)	1(14.2)	7(2.9)	
T.cruris	5(100)	0	5(2.04)	
T.ungium	2(40)	3(60)	5(2.04)	
T.pedis	2(66.7)	1(33.3)	3(1.2)	
T.capitis	3(100)	0	3(1.2)	
T.corporis+T.cruris	71(80.7)	17(19.3)	88(35.9)	
T.corporis+T.cruris+T.facei	6(85.7)	1(14.3)	7(2.9)	
T.corporis+T.facei	3(60)	2(40)	5(2.04)	
T.corporis+T.cruris+T.mannum	2(100)	0	2(.81%)	
T.facei+T.mannum	1(100)	0	1(0.40)	
T.corporis+Tpedis	1(100)	0	1(0.40)	
T.facei+T.cruris	1(100)	0	1(0.40)	
Total	189(75.9)	56(22.8)	245	

Out of 245 samples, 162 were KOH positive samples, out of which 151 (91.5%) were culture positive and 11 (13.8%) samples were culture negative. In 83 (33.9%) KOH negative samples, 14 (8.5%) were culture positive and rest 69 (86.2%) were negative by culture. (Table 3)

Table 3: Comparison of KOH mount and culture in identification of fungus

	Culture negative N (%)	Culture positive N (%)	Total N (%)
KOH negative	69 (86.2)	14 (8.5)	83 (33.9)
KOH positive	11 (13.8)	151 (92.6)	162 (66.1)
Total	80 (37.7)	165 (67.3)	245 (100)

From the 165 culture positive samples; T mentagraphytes was the most commonly isolated dermatophyte with 153 (%) isolates, followed by T. rubrum from 5(3.03%), T. violaceum from 3(1.81%), T. tonsurans and Microsporum canis from 2(1.21%) samples each.

Majority (68/153) of cases of T mentagrophytes were isolated from cases of T corporis, whereas 3/5 cases of T. rubrum were isolated from mixed infection of T. corporis +T. cruris. All T. violaceum were isolated from cases of T. capitis, all (2/2) isolates of T. tonsurans were from cases of T. corporis+ T. cruris, and both isolates of M. canis were from mixed infections with T. corporis.

Discussion

Dermatophytes fungi are the etiologic agents of skin infection commonly referred to as ringworm. These infections are not dangerous but as chronic cutaneous infections they may be difficult to treat and can also cause physical discomfort for patients.

In the present study, out of the 245 cases, 189 (77%) were male and 56 (22.9%) were female. The commonest age group was 16-30 years (59.2%) followed by 31-45 years (19.6%). Other studies done by Singh et al, Kaur et al, Siddappa et al andJanardhan et al have similar findings[6,7,8,9].They also saw a male preponderance and the age group most commonly affected was 16-30 years in these studies as well.The reason for this could be due to increased outdoor physical work and increased chances for contact infection than female. Noronha et al reported T.corporis was more common clinical presentation with 37 cases (24.7%) which was affecting more common in female with 20 cases (54%) compared with male with 17 cases (45.9%) [10].Higher incidence may be due to common practice of sharing cloths, bathing towel and overcrowding. Janardan et al showed the incidence of T.facei was 10 cases (5%) effecting 4 male and 6 female.This could be because of sharing of common or contaminated face products, rough scrubbing and contaminated objects such as Towel and by increased exposure to harsh detergents while doing household work.T. ungium was also more commonly seen in females.[9]contrary to our study, Karmakar et al showed a preponderance of cases in 0-11 years age group[11].

In the present study out of 245 patients, T.corporis was commonest clinical type and was seen in 102 (41.6%) patients followed by T.corporis+T.cruriswith 88(35.9%) cases. In studies by Singh et al, Noronha et al and Bindu et al, also T. corporis was the main clinical presentation observed[6,10,12,].

Only 3(1.2%) cases in our study had T. capitis. T.capitis has been reported to be rare entity from some other studies also in northern India[13, 14, 15].Whereas in studies by Siddappa et al, Janardhan et al and Karmakar et al,and the prevalence of T. capitis was reported to be 18%, 9% and 6.93% respectively which was higher than our study[8,9,11].Similar to our study,in studies by Sidappa et al, Janardhan et al T capitis was more commonly seen in males[8, 9]. Higher incidencein males may be due to visit to saloons where they use contaminated razors and combs.

In the present study, most of clinical presentations were seen in the age group of 16-30 years followed by 31-45 years while T.capitis was found most common in the age group <15 years.

The incidence of T.mannumin our study was 2.8% which is in concordance with studies of Vena et al (1.7%)and Janardhan et al (3%).[3,9] Occupational trauma may act as a precipitating factor.

In the present study the prevalence of T.pedis was1.2% which is very less as compared to studies

by Janardhan et al, Bindu et al and Huda et al who reported incidence of T.pedis as4%, 7% and 3.3% respectively[9,12,16].

The most common mixed clinical infection seen in the study was T.corporis+T.crurisin35.9% patientswhich was similar to a study by Noranha et al (35.3% prevalence of T corporis + T. cruris)[10]. However, Janardhan et al showed the incidence of mixed types of infection to be only 2% which is far less than these studies[9]. The higherprevalence of multiple site involvement showed in our study may be due poor hygiene and delay in seeking treatment.The role of fomitesin the spread of dermatophytosiscannot be undermined in dermatophytic infection because sharing of beds, linen, and clothing is all too common in family.

In the present study out of 245 samples, 162 were KOH positive samples, out of which 151 (91.5%) sample culture positive and 11(13.8%) samples were culture negative. The positivity of KOH in different studies ranges from 53% to as high as 90%. (Table 6).In 83(33.9%) KOH negative samples, 14 (8.5%) were culture positive and rest of 69 (85.2%) were negative by culture.The handiness involved in these techniques of sampling and in examining the KOH mount might be different at different places, which might account for the difference in microscopic and culture finding makingit essential that all the KOH negative samples should be cultured.

In the present study, among the total of 165 isolates; majority were [153(92.7%)]T.metagraphytes, 68(66.7%) of which were isolated from T.corporis. There was no T. mentagraphyte isolate from cases of T.capitis. Noronha et al showed that among 29(48.3%) isolates ofT.mentagraphytes, majority [9(45%)] were isolated fromT.corporis.In a study by Madhavi S et al majority of [5(55.5%)] T.mentagraphyteswere isolated from T.corporis, however,T.rubrum was the predominant isolate in their study comprising 51.7%of the total isolates[17].

Among the 5(3.1%)isolates of T.rubrum, majority [3(60%)] were isolated from mixed clinical types T.corporis+T.cruris. Among the 15(51.7%) T.rubrum isolates, majority [5(33.3%)] wereisolated from T.corporis followed by T.cruris.Similar to our study Noronha et al showed T.rubrum was second most common isolate in the study comprising 23(38.3%) of the total isolates[10].

In the present study T.violaceum was isolated from 3 cases, all the cases being T.capitis. Similarly Madhavi et al showed 2(6.9%) isolates of T.violacium, all cases being T.capitis. Noronha et al showed T.violaceum 3(5%) were isolated from mixed clinical types with 2(6.9%) and T.capitis with 1(20%) [10].

In the present study, only 2(1.2%) isolates of T.tonsurans were found and both were isolated from mixed clinical infection ofT.corporis+T.cruris.Similarly in a study by Pulariet al 2 (1.2%) isolates of T.tonsurans 2(1.2%) were cultured; 1 each from T.corporis+T.cruris and T.capitis[18].

In our study 2(1.2%) isolates of M. canis were seen; 1 each from T.corporis+T.cruris and T.corporis+T. cruris+T.facei.In a study by Sundaram etal only one isolate ofM.canis 1(0.5%) was isolated from a case of T.corporis[19]. Generally dermatophytes exhibits a cosmopolitan profile, that is they found in different region of the world with variations in the frequency of particular species as geoclimatic and social conditions interfere with the distribution of dermatophytes species.

Conclusion

T corporis was the most common clinical presentation and T.mentagraphytes was the most common species isolated from the samples. The infections were more common in 16-30 years age group and in males. There are variations in the distribution of the clinical infection and the isolates in different studies.

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Professional and Psychological Help Seeking Behavior among College Students

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Abstract

Mental and behavioral problems are the leading causes of health problems in young people both in high and low resource countries, accounting for one third of all years lost productivity due to this disability. It implies that, healthy students can productively contribute to the development of a country.[19] As India is the world's most youthful nation college students seeking professional and psychological help for their mental health issues and becoming mentally healthy is essential for their successful college life. This study is conducted to understand the Professional Psychological Help Seeking Behavior of college students for their Mental health issues and to know the gender differences. Convenient sampling was used with 60 respondents from a reputed college of Mangaluru, Karnataka. Attitude towards professional psychological help seeking scale (Fischer, 1995) and Socio demographic profile were used for data collection. The study revealed poor attitude among college students for professional help seeking for mental health and recommends for an increased education and awareness to reduce the perceived stigma for help seeking. More defined policies and programmes have the potential to improve students' access to a full range of mental health services which in turn contribute to overall development.

Keywords; *Professional Help-seeking, Mental Health, College Students*

Introduction

Students in India

According to World Health Organization (WHO), Mental and behavioral problems are the leading causes of health problems in young people in both high and low resource countries, accounting for one third of all years lost productivity due to this disability. It implies that, healthy students can productively contribute to the development of a country. As stated by Division for Social Policy and Development Disability of United Nations, Mental health issues are among the ten leading causes of disability in both developed and developing countries. Poor mental health is both a cause and a consequence of poverty, compromised education, gender inequality, ill-health, violence and other global challenges. It impedes the individual's capacity to work productively, realize their potential and make a contribution to their community. There is growing recognition within the international community that invisible disabilities, such as mental health is one of the most neglected yet essential development issues in achieving internationally agreed development goals. India is the world's most youthful nation, with two-thirds of population under the age of thirty-five. It is the strength and skills of these youngsters that will usher in New India. [20] Therefore, college students seeking professional and psychological help for their mental health issues and becoming mentally healthy is essential for their overall development which in turn contributes for healthy nation.

Mental Health Issues among College students

WHO defines Mental Health as "a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community". It also emphases that "mental health is not just the absence of mental disorder".

Mental health issues are a set of clinically recognizable symptoms present in an individual for a period of time and the individual experiences distress due to these symptoms as they interfere with his or her personal functioning like academic work, relationships

and social interactions. Mental health professionals associated with college mental health services also opine that late adolescent and college going persons are highly vulnerable to the limitations in personal growth, imposed by emotional disturbances of varying severity. [21]

Transition from college students to adulthood, especially among college students can be an extremely stressful period owing to many challenges those can ultimately affect their mental health. Stress can be negative or positive to an individual, depending on the factors such as strength and persistence of the stress, social support. [22]

The Mental-health symptoms during the transition period have a significant impact on the development of students and their social and economic integration, including employability. Mental-health issues have a significant impact across a wide range of developmental outcomes, limiting opportunities for social integration. One area that can be impacted by mental-health conditions during adolescence and young adulthood is the development of safe and healthy relationships with peers, parents, teachers and romantic partners. In fact, adolescence is the developmental period that is critical for identity formation and taking on roles, especially with peers. [23]

According to the Report on Mental Health and Development 2008 Mental and behavioural issues are the leading causes of health problems in young people in both high- and low-resource countries accounting for one third of all years lost productivity due to this disability.

Attention to global mental health moves beyond treatment-oriented programmes in health-care settings to include broader approaches inspired by public-health and social-inclusion considerations. Recently, mental-health issues have attracted global attention. The 2007 Lancet Series on Global Mental Health led to the launch of a coordinated Movement for Global Mental Health, comprising over 95 institutions and 1,800 individuals worldwide.

In 2010, the World Health Organization (WHO) produced a Report on Mental Health and Development (2010a), highlighting people with mental illnesses as a vulnerable group subject to stigma and social isolation, human-rights violations and exclusion from policies and decision-making that affected them. Later that year, in its resolution on global health and foreign policy, the United Nations General Assembly recognized the need to target mental health in development, reinforcing previous international commitments toward mainstreaming disability issues in development. The WHO has developed the Mental Health Gap Action Programme, along with technical tools to support non-specialist mental-health service capacity in low- and middle-income countries. This international momentum to acknowledge and address the global burden of mental-health problems is critical to dealing with this issue at a global level.

Review of Literature

Kumar Rajesh, Prinja Shankar and Lakshmi P.V.M.[24] conducted a study to assess the perceived health problems and help seeking behavior and utilization pattern of adolescent health clinics. A pre-tested, semi-structured questionnaire was administered to 360 school going college students who were selected by stratified random sampling from two sectors of Chandigarh where services were being provided by a school-based and dispensary-based adolescent health clinic. The study revealed that majority (81%) of the college students having some health problem during last three months prior to the survey; predominant (60%) problems were psychological and behavioral in nature. To resolve these problems boys consulted mainly friends/peers (48%) while girls consulted their mothers (63%). Compared to the dispensary-based adolescent health clinic, utilisation was significantly higher in a school- based clinic where proportion of psychological or behavioral problems reported was also significantly higher.

Daniel Eisenberg [25] conducted a study using random sample of 5,555 college students from a diverse set of 13 universities, with an objective to see the association of help-seeking behavior with both perceived public stigma and people's own stigmatizing attitudes or personal stigma. There were three main findings: (a) Perceived public stigma was considerably higher than personal stigma; (b) personal stigma was higher among college students with any of the following characteristics: male, younger, Asian, international, more religious, or from a poor family; and (c) personal stigma was significantly and negatively associated with measures of help seeking whereas perceived stigma was not significantly associated with help seeking.

Eisenberg, Golberstein and Gollust [26] conducted a study with the objective of quantify mental health service

use and estimate how various factors are associated with help-seeking and access in a university student population. A Web-based survey was administered to a random sample of 2785 college students attending a large, public university with a demo- graphic profile similar to the national student population. The study revealed that, 30% of respondents perceived a need for professional help for their mental or emotional health in the previous year. As expected, college students with current mental health issues, as indicated by positive screens in the PHQ (Patient Health Questionnaire) depression or anxiety instruments, were significantly more likely to perceive a need for services and to receive services.

Reviewed studies show that the help-seeking behaviour of students has focused mainly on the friends, parents or try to cope alone, and subsequently turn to adult. Stigma is a considerable barrier to mental health service delivery among students. In addition to that, embarrassment and the lack of basic knowledge about mental health impact on the Help seeking behaviour of students. The issue of stigma is further challenged by the lack of quality mental-health services.

Methodology

Title: Help-seeking Behavior of College students for Mental Health Issues

Aim of the Study: To assess the Help-seeking Behavior of College students for Mental Health Issues.

Objectives: 1. To understand the Professional Psychological Help seeking behavior of college students for their Mental health issues

2. To know the gender differences in Professional Psychological Help Seeking Behavior among college students.

Importance of the study: Mental health issues among college students are detrimental to the development of an individual and also to the country**.** Mental and behavioral problems are the leading causes of health problems in young people in both high and low resource countries, accounting for one third of all years lost productivity due to this disability [i] Thus, healthy students productively contribute to the development of a country. Transition from college students to adulthood, especially among college students can be an extremely stressful period owing to the many challenges those can ultimately affect their mental health.[4] Hence, seeking professional and psychological help for mental health is essential for the college students. This study is conducted in Mangalore, Karnataka which is known for its educational excellence and attracts student from across the nation.

Research Design: Cross-sectional Research design was applied.

Population: The target population was first-year degree college students of two reputed colleges in Mangaluru, Karnataka, India.

Sample Size and Technique: The sample size was 60, Convenient Sampling method was applied for the study.

Sources of data: The study used Primary data and reviewed secondary literature.

Description of the Tools

1. Socio Demographic Sheet developed by the researcher includes age, gender, religion, hobbies, type of college, mode of stay, financial background, parents' occupation and qualification of parents, and such other information that taps their college life.

2. Attitude towards Seeking Professional Psychological Help Scale (Fischer et.al., 1995): The scale contains 10 items, reverse score items 2,4,8,9 and 10, and then add up the ratings to get a sum. Higher scores indicate more positive attitudes towards seeking professional help. Calculate a mean for males, for females, and for each of the groups to examine group differences. The scale is on public domain.

Data Analysis: The data is analyzed through descriptive statistics. Frequency, Mean and Standard Deviation are used and SPSS 17.0 Version is applied.

Results and Discussion

Table 1- Demographic Variables

Variables	Frequency %
Male	30 (50%)
Female	30 (50%)
Total	60 (100%)

Cont ... **Table 1- Demographic Variables**

18 Years	39 (65%)
19 Years	21 (35%)
Total	60 (100%)
High Income	8 (13.3%)
Middle Income	48 (80%)
Low Income	4 (6.7%)
Total	60 (100%)

Table No.1 shows that there were equal number of male (50%) and female (50%) college students. There were 65% college students in the age of 18 years, 35% were of 19 years age group. Regarding the financial background of the participants, 8% of college students were from high income background, 48% were middle income background and 4% were from low income background.

Table 2- Help Seeking behaviour among College students

ATPPHS (Attitude towards professional psychological help seeking)	**Mean Score Mean Percentage**	**Standard Deviation**
Help Seeking Behaviour among college students	14.06 (46.86%)	±6.20
Male	11.46 (38.2%)	±5.38
Female	14.86 (49.53%)	±5.17

Table No. 2 shows the mean score of Attitude towards professional psychological help seeking behaviour among college students. The maximum score of the scale was 30 whereas the overall mean score obtained in this study is 14.06 (±6.20) with mean percentage 46.86%. It shows a low level of help seeking behaviour among college students. With regard to gender, the mean score of male college students was 11.46(±5.38) with mean percentage 38.2%. This shows low level of help seeking attitude among male college students. Whereas, the mean score of help seeking (ATPPHS) among female college students was 14.86 (±5.17) with mean percentage 49.53% which also shows low level of help seeking attitude among female college students. Thus the study shows poor level of help seeking behaviour among both male and female college students. This will hamper the overall development of the student population by affecting their mental health and lead to mental health issues.

The study shows that the Professional and Psychological Help Seeking Behaviour among both the male and female college students are in low level. The mean score of ATPPHS among male college students is much lower than the mean score of female college students who in turn also seek poor level of help for their mental health issues. This will lead to unprofessional help seeking resulting in intensifying mental health issues among college students which is highlighted in study by Chandrashekar [iii] that 15 to 20% of the college students having recognizable mental disorders. Only a few colleges provide counseling services through trained manpower in our state. College students with mental morbidity do not seek Psychiatric treatment because psychiatric services are not available in an affordable and approachable manner, stigma attached to mental disorders and lack of awareness. Thus majority of the college students, who need help, remain unattended and uncared. Similarly, NAMI conducted a national survey of college students to learn about their mental health in colleges in U.S.A. and highlighted that, stigma remains the number one barrier to college students seeking help and survey respondents shared valuable ways in which schools can work more effectively to combat stigma.

Thus, there is a need to create awareness on mental health among college students. The professional help seeking also need to be encouraged through the active involvement of teachers and college management who can help the college students for professional intervention by introducing Campus Mental Health Services which will help to combat stigma and promote mental health among college students. The same has been highlighted by Eisenberg, Hunt and Speer [10] who emphasized about help-seeking behavior for mental health issues in college population and offers a perspective on next steps for improving knowledge and practice in this area. He also stressed that, traditional barriers such as stigma can only partially explain the high prevalence of untreated disorders and suggested for campus-based intervention strategies such as anti-stigma campaigns, screening programs and gatekeeper trainings. Such programs will create awareness among students; helps to adopt

healthy coping styles and also to seek professional and psychological help for their mental health issues.

Conclusion

In total, healthy students can productively contribute to the development of a country. Mental health is not popular area in India where the concept of campus mental health and policies to promote mental health in schools and colleges is minimal. The help seeking behaviour of college students for their mental health issues need to be encouraged by the government and policy makers in such a way that promotes their mental health and intergenerational equity which will contribute to their overall development.

Ethical Clearance: This study is a part of my Ph.D Study and Ethical Clearance is taken from Institutional Ethics Committee, School of Social Work, Roshni Nilaya, Affiliated to Mangaluru University, Mangaluru.

Source of Funding: Self

Conflict of Interest: Nil

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Evaluation of Prehypertension among School Going Adolescents in Chennai

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Abstract

Aim:- Adolescence is an important phase of life and increased stress has made them prone for early development of Metabolic disorders. Worldwide prevalence of Prehypertension is increasing and early identification of which will help to manage the development of early hypertension and its associated complications. Hence, current study aims to evaluate the prevalence of prehypertension among school going adolescents in Chennai.

Methods:- The study was conducted among school going adolescents *(n-264)* in Chennai between the age group 15-19yrs. Anthropometric measurements were taken and stress and sleep hygiene were assessed using validated questionnaires. Blood pressure was recorded using Hawkley random zero sphygmomanometer.

Results:- The overall prevalence of Prehypertension was found to be 22.3%. Prehypertension was found to be more in females (23.1%) than males (21.6%).

Conclusion:- There is an increased prevalence of prehypertension among school going adolescents in Chennai. Adolescents should be taught about the importance and benefits of healthy lifestyle for a healthy future.

Keywords:- *Adolescents, Prehypertension, Sleep, Stress, Cardiac issues*

Introduction

Adolescence is a critical and crucial phase of human life and plays an important role in determining an individual's future. As per WHO, Adolescence is the 'period between 10-19years of life'[1]. Adolescence is recognized as both enjoyable and stressful period, and the stress phase of adolescence is reported as the most stressful period in the entire lifespan of an individual. In current era, along with the pre-existing psycho-physiological stress, academics, family and peer pressure has increased the stress level and have made adolescents more prone for psycho-somatic disorders [1].

Prehypertension is a recently coined term and in 2003, the Seventh Report of the Joint National Committee on prevention, detection, evaluation and treatment of high blood pressure (JNC7) has defined prehypertension as 'the Systolic blood pressure (SBP) between 120-139mmHg or the diastolic blood pressure (DBP) between 80-89mmHg'[2]. Prolonged persistence of Prehypertension makes an individual more prone for early development of sustained hypertension[3,4]. Hypertension is a global health issue and has been identified as major risk for most of the cardiovascular diseases. In 2010, Hypertension has been reported as major cause for morbidity and mortality worldwide [5].

In recent years, prevalence of prehypertension is increasing among adolescents and remains undiagnosed[6,7]. Prehypertension being a risk factor for hypertension if left undiagnosed makes adolescents to

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develop early hypertension thus making them prone for early cardiovascular diseases and premature death [8,9]. Hence, early identification of prehypertension among adolescents becomes need of the hour.

Material and Method

Study participants:-

A cross sectional study and was commenced after obtaining permission from the institutional ethics committee. Study participants were recruited from a private school in Urban Chennai, and the school was selected using computerized randomization software from the school list of urban corporation. Participants were healthy school going adolescents and between the age group (15-19yrs) *(n-264)*. Students with pre-existing primary and secondary hypertension were excluded and participants those who got parent's consent and also gave assent were included in the study.

Study tools:-

General and demographic details about the participants were collected using a questionnaire. Anthropometric measurements like Height, weight, Neck circumference (NC), Waist and Hip Ratio were measured. Blood pressure was assessed using Hawksley random zero sphygmomanometer.

Stress was assessed using Perceived Stress Scale (PSS). PSS is a 10 item self reported questionnaire where the participants answer to ten different questions/ situations. Based on a structured scoring pattern the participants will be categorized in to mild, moderate and severe stress[10]. Sleep hygiene was assessed using Epworth Sleepiness Scale for Children and Adolescents (ESS-CHAD). ESS-CHAD has eight different situations for which the participants should answer his chances of dozing in a scale of 0-3. Total score < 10 signifies good sleep hygiene and total score >10 signifies presence of Excessive Daytime Sleepiness, a sign of compromised Sleep hygiene[11].

Study Procedure:-

The school authorities were explained about the purpose and benefits of the study and written permission was obtained. Informed consent form was distributed two days before the data collection day to get consent from parents and assent was also obtained from the participants. General questionnaire, Perceived Stress Scale, Epworth Sleepiness Scale were explained to the participants and were assisted to complete them. Anthropometric measurements like Height, weight, Neck circumference (NC), Waist-hip ratio (WHR) were taken and BMI was also calculated.

Arterial Blood pressure was measured using a Hawksley random zero sphygmomanometer with appropriate size cuffs. The participants were asked to relax in supine lying for 10minutes and Blood Pressure (BP) was recorded in sitting position. Three readings were taken with regular intervals and BP was noted[5]. BP of all the participants were recorded by trained healthcare professionals

Statistical analysis

The Data were tabulated in MS Excel sheet and SPSS Version 21.0 was used to analyze the data. Descriptive statistics was calculated for background variables. Association between categorical variables was tested by chi-square test and $p<0.0.5$ was taken as statistically significant.

Findings

Total number of participants considered for the study were 271 and those who willingly participated and completed the study were 264, consisting of 134 males and 130 females (n-264). Mean age of the study participants was 15.75+0.65. Among the total participants 50.8% were males and 49.2% were females. Majority of the study participants were from board exam appearing class (39%).

22.3% of the study participants were found to have prehypertension out of which 35.5% of them belong to the board appearing class. (Figure 1)

Genderwise, 21.6% of males and 23.1% of the females were found to have prehypertension though the p value was statistically insignificant.

Majority of the participants were found to be moderately stressed. 19% of participants with mild stress, 26.8% of participants with moderate stress and 17.2% of participants with severe stress were found to have prehypertension and p value was found to be statistically insignificant.

32.2% of the participants with compromised sleep hygiene were found to have prehypertension and p value was found to be statistically significant showing that reduced sleep hygiene increases chances of developing

blood pressure.

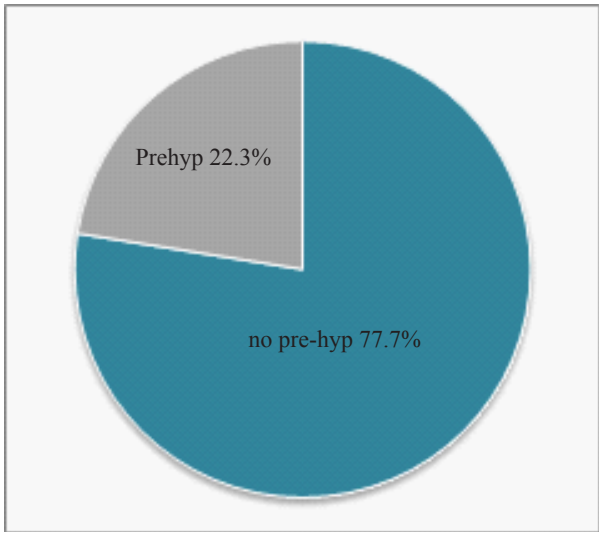

Fig 1. Prevalence of Prehypertension among adolescents

Table 1. Genderwise prevalence of Prehypertesnion among adolescents

Gender	Prehypertension	p value
Males	29 (21.6%)	0.780*
Females	30 (23.1%)	

*p<o.o5 is statistically significant

Table 2. Stress and Prehypertension

PSS Score	Prehypertension	p value
Mild stress	15 (19%)	0.244*
Moderate stress	34 (26.8%)	
Severe stress	10 (17.2%)	

*p<o.o5 is statistically significant

Table 3. Sleep and Prehypertension

ESS Score	Prehypertension	p value
ESS <10	40 (19.5%)	0.03*
ESS ≥ 10	19 (32.2%)	

*p<o.o5 is statistically significant

Discussion

The current study shows the prevalence of Prehypertension among school going adolescents to be to be 22.3%**.** A study conducted among adolescents in East Nigeria showed prevalence of Prehypertension among adolescents to be 17.3% with females having more prevalence than males[12]. Another study conducted in Houston showed that atleast 30% of adolescents had one elevated BP during recording[13]. A study conducted in Kerala reported prehypertension among adolescents to be 24.5%[14] and another study conducted in southern part of Tamilnadu showed prevalence of prehypertension among school going adolescents to be 14.1% [5]. These reports reveal the fact that prevalence of prehypertension is more among adolescents which could be due to their psycho-physiological, psycho-social factors and other lifestyle modifications**.** Genderwise, prehypertension was found to be more in females (21.6%) than males (23.1%). Ingeneral females are more prone for stress and related psychological issues due to hormonal and other psycho-social factors, which along with academic pressure would have made females to develop prehypertension than male adolescents [13].

Stress is common among school going adolescents and has negative impact on health. Distress is a phenomenon which triggers negative pathways in the host and increases the level of stress hormones. Stress hormones such as cortisol, catecholamines increases heart rate, damages blood vessels and causes prehypertension, which if undiagnosed slowly progresses to chronic Hypertension[15]. In our study we found that adolescents with stress develop prehypertension though the p value was statistically insignificant

The results have shown that adolescents with compromised sleep hygiene (ESS>10) have prehypertension. Sleep is required for good physical and mental health. In adolescents sleep becomes an indispensable component required for learning, memory consolidation and healthy growth. Sleep deprivation triggers stress hormones and sympathetic nervous system. Frequent stimulation of sympathetic nervous system increases free radicals and damages blood vessels predisposing to prehypertension and early cardiac diseases [15,16,17,18,19]**.**

Persistent prevalence of prehypertension makes adolescents more prone for development of early hypertension. According to WHO, Hypertension is major risk factor for increased mortality. Young individuals with hypertension were more prone to develop hypertensive cardiovascular complications than older individuals [20], which leads to decreased quality of life and premature death. Prehypertension

among adolescents has been found to be associated with cardiac, renal alterations and target organ damage [21,22]. Adolescents with prehypertension were found to have Left Ventricular Hypertrophy (LVH). Even adolescents with mild elevated blood pressure were found to have target organ damage and early occurrence of metabolic syndrome [23]. Than normotensive adolescents prehypertensive adolescents were reported to have increased arterial stiffness and decreased diastolic function [24].

Conclusion

The current study shows that prevalence of prehypertension is high among school going adolescents in Chennai. Persistent prevalence of prehypertension makes them more prone for development of early hypertension and cardiac diseases which inturn reduces their quality of life. Hence, adolescents should be taught about stress management, importance of physical exercises and healthy diet to lead a healthy life [16,17].

Conflict of Interest:- No conflict of interest

Source of Funding:- Self funding

Ethical Clearance:- Institutional ethics committee (IEC) clearance obtained.

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Study of Death among Children Below Five Years of Age and its Relation to Parentseducation and Place of Residence Using Verbal Autopsy as a Tool in Deharadun

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Abstract

Around the world more than 10 million children under the age of five die every year and the world poorest countries continue to bear the burden of these deaths [1]. Prevalence of under-five mortality vary from 4 to more than 28 deaths per 1000 live births The study was conducted to find out relation in-between child mortality of under-five years of age and parents education along with place of residence using verbal autopsy in Dehradun.

Methodology: The survey was done on all the house of the deceased children residing in our field practice areas by visiting their houses.

Results: Most of the parents were found illiterate among 83 deaths reported during study period.

Conclusion: Many of the under five children deaths can be prevented if parents are literate, which can help in reducing mortality rate among under five children.

Keywords:*poorest countries****,*** *parent's education****,*** *deceased children.*

Back ground

Information on factors leading to death is extremely important for policy-making, planning, monitoring and evaluation of health programs, as well as necessary for field research, comparisons, and awareness. This is particularly more so important for childhood deaths, which is constituting a major portion of all deaths, and of which many intervention programs are currently attempting to reduce mortality among under five deaths1.. Education has been one of the key concepts used as a variable in explaining health. The influence of parental education on infant and child health and mortality has proved to be universally significant. In the literature on child health, parental education has received particular attention, as indeed have all other social, demographic and health characteristics of the parents 2.

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Material and MethodsThe study was undertaken for one year in the field practice areas of department of community medicine HIHT Dehradun after taking approval of institutional ethical committee. The total population registered under Rural Heath Training Centr e(Rajeev Nagar) & Urban Health Training Centre was 12,588 and 12,930 respectively out of which under five children were 1297 at RHTC and 1325 at UHTC.

All deaths except still births registered with Rural and Urban Health Training Centre were included in the study. When a child died, the mother or the respondent was questioned in detail about the parents education and place of residence of children prior to death. A drafted questionnaire (Englishversion) developed by WHO, was modified suitably, as well as certain variables were added to it to find out any correlation in-between under five children death and parents education along with place of residence[3]. The information so collected, was first coded and then entered in the computer. The analysis was done by using SPSS software. Appropriate statistical methods (proportion and chi – square test) were applied as per

requirement.

Result

Total number of deceased children in both the areas were 83, out of which 39(46.9 %) were in rural area and 44 (53.1 %) in urban area. Out of 39 deaths in rural area, 29 (74.4 %) died before the age of one year while 10 (25.6 %) died in age group of 365 days - < 5 year. Similarly in urban areas 44 deaths took place. Out of these 25 (56.8 %) died below age of 1 year and 19 (43.2 %) died in age group of 365 days- < 5 year. Table 2 and table 3 shows that proportionately more children's had died of illiterate parents then of literate parents irrespective of urban and rural areas.

Table 1 distribution of deceased children by age, sex and place of residence (n=83)

	Rural (%)	Urban (%)	Total deaths (%)	Chi squar value	Degree of freedom	P value
Age of deceased children						
0-28 days	17 (43.6)	15(34.1)	32(38.6)	3.219	2	>0.05
29-<365 days	12(30.8)	10(22.7)	22(26.5)			
365 days-< 5Yrs	10(25.6)	19(43.2)	29(34.9)			
Sex of deceased children						
Male	18(46.2)	26(59.1)	44(53.0)	1.389	1	>0.05
Female	21(53.8)	18(40.9)	39(47.0)			

Table 2 : Distribution of deceased children by education of father and place of residence ; n = 83.

Education of Father	Place of Residence		Total
	Rural	Urban	
	No. of deaths (0–5 yrs)	No. of deaths (0– 5yrs)	No. of deaths (0–5 yrs)
Illiterate	21 (52.8 %)	22 (50.0 %)	43 (51.8 %)
Just illiterate	4 (10.3 %)	10 (22.7 %)	14 (18.9 %)
Primary	8 (8.5 %)	3 (6.8 %)	11 (13.3 %)
Junior high school	3 (7.7 %)	3 (6.8 %)	6 (7.2 %)
High school	3 (7.7 %)	6 (13.6 %)	9 (10.8 %)
Intermediate	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)
Graduate & above	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)
Total	39 (100.0%)	44 (100%)	83 (100.0%)

Table 3 : Distribution of deceased children by education of mother and place of residence ; n = 83.

Education of Mother	Place of Residence		Total
	Rural	Urban	
	No. of deaths (0–5 yrs)	No. of deaths (0– 5yrs)	No. of deaths (0–5 yrs)
Illiterate	29 (74.4 %)	32 (72.7 %)	61 (73.5 %)
Just illiterate	0 (0.0 %)	3 (6.8 %)	3 (3.6 %)
Primary	5 (12.8 %)	1 (2.3 %)	6 (7.2 %)
Junior high school	2 (5.1 %)	4 (9.1 %)	6 (7.2 %)
High school	2 (5.1 %)	2 (4.5 %)	4 (4.8 %)
Intermediate	1 (2.6 %)	2 (4.5 %)	3 (3.6 %)
Graduate & above	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)
Total	39 (100.0%)	44 (100%)	83 (100.0%)

Discussion

In the present study higher percentage of mortality was observed amongst children, belonging to fathers who were illiterate (53.8 % - rural and 50.0 % - urban). Children belonging to illiterate mothers also showed higher percentage of mortality in both rural and urban areas i.e. 74.4 % and 72.7 % respectively. It is generally observed that the literacy status of mothers in urban and rural areas has a greater impact on the health status of children particularly in relation to mortality, than that of fathers.According to NFHS – 3 Uttarakhand [4] under 5 mortality was 97.2 % whose parents had no education, while it was 54.1 % among those whose education was less than 10 years and 28.1 % where parents had education , of 10 years or more. Findings by other authors also showed that mortality rates in illiterate parents were higher as compared to the literates.The literacy rate in the study area particularly in the urban slums is very low which could be again due to migratory population from other states. If we compare the literacy level with that of Uttarakhand NFHS – 3 (Uttarakhand)[4] we find that 86 % of males and 65 % females are literate in Uttarakhand while reverse is the case of our study population.

In a study done by Katz et al (2003)[5] observed that maternal and paternal education was important as predictors of mortality only for infant who died in the post-natal period, with maternal education providing more protection than paternal education. Maternal and paternal education were independent predictors of mortality beyond the neo natal periodwhich suggests the importance of educated men in this paternalistic society in addition to the role played by the mothers in protecting the infant from mortality risks. In another study done by Syamala(2004)[6]observed that the association between mother's education and survival rate of children during infancy is strong and direct. This pattern of association is observed in each group of the mother.

In another study done by Khalique et al (1993) [7]concluded in his study conducted in 9 villages of Rural Health Training Centre, Jawan, Aligarh, India observed that higher percentage of mortality was presents amongst children belonging to fathers who were illiterate or just literate (59.38 % Rural and 56.25 % Urban) . Children belonging to illiterate or just literate mothers also showed high percentage of mortality in both rural and urban areas i.e. 73.44 % and 62.50 % respectively. It was observed that the literacy status of mothers in urban and rural had a greater impact on the health status of children particularly in relation to mortality, than that of fathers in terms of percentage. It was also observed that mortality was low in children whose fathers had intermediate or degree qualification (6.25 % rural and 12.50 %). Children of mothers with similar educational

qualification also showed low mortality (3.12 rural and 12.50 urban).It was also observed in NHFS-3 Uttarakhand (2006)[4] that children, whose mothers have no education are thrice as likely to die before their first birthday as children whose mothers have completed at least 10 years of school. Our study also indicates more or less similar results in accordance of previous studies.

In a study done in Turkey byToros and Kuluamong 1982 birth cohorts found that father's education to stand out as one of the most important factors associated with infant survival. They report that babies whose fathers do not have primary school education are 1.6 times more likely to die within the first year of life than babies whose fathers have at least finished primary school. Babies whose mothers have no primary school education, however,are 1.15 times more likely to die in their first year[8].Where as in a cross-national study by Mensch, Lentzner and Preston (1985), it was shown that mother's education was a more powerful explanatory variable than father's education in rural areas[9].In another study done by Hobcraft, McDonald and Rutstein (1984) showed in their cross-national study that in Latin American countries, mother's education had more explanatory power, while in some Asian and Islamic countries, father's education and occupation and mother's work status emerged as rival predictor variables .[10]GŸrsoy-Tezcan also found in their study in 1992 that the husbands' formal education surpassed the women's formal education as well as all other criteria in explaining child mortality[11]. Where as In 1989 Preston's Is literacy a missing link between female schooling and reduced child mortality in developing countries? An affirmative answer might be based on Preston's (1989) model of mortality reduction, which gives a central place to literacy in the spread of improved health knowledge to mothers of young children[12].

Another study done by Jain in 1985found the effect of female education is complementary to that of health services. In fact, under certain circumstances the effects of the two factors may even be synergistic, because both facilitate changes in health seeking behaviour. These points were illustrated in an earlier study by comparing education-specific infant mortality rates among rural women of two states in India, Kerala and Uttar Pradesh (Jain 1985b)[13]. In an interesting study done by Caldwell in Nigeria 1975 found that maternal behaviour is probably important, he observed an area in Nigeria far from medical services much better survival rates were found among the children of mothers with schooling (usually incomplete primary schooling) than those without schooling.(Orubuloye and Caldwell 1975)[14] whereas Caldwell in 1980 reached to the conclusion that the main proselytizer for modern science is the school, even in its earliest grades when no science is taught formally (Caldwell 1980) [15].

Education of mother that were significant in their magnitude and each likely to result in the greater survival of the children of more educated mothers. The first of these is that educated mothers were more likely to take children to the health centre for both preventive and curative medicine. Their mothers-in-law allowed it and expected it, for most parents now try to arrange their sons' marriages to educated young women and one of their strongest motives is that such women are more likely to ensure the survival of their grandchildren (Caldwell,1983b) [16]. It was observed that

Belief in the necessity of access to modern health services intensifies with each year at school. It is this import of both modern medicine and modern education with its commitment to modern medicine, and indeed all modern science, which determines how thoroughly both curative and preventive services are used; it explains the large differentials in child survival by maternal duration of education found in the contemporary Third World to a greater degree than has ever been the case in the West (Caldwell1986).[17]

Conclusion

literacy of parents plays a crucial role in decreasing under five mortality in one way or the other ways especially in poorer countries. Our emphasis must be on parent's literacy rate while we make policiesand programs for under five children.

Conflict of Interest – none

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Prevalence of Goiter and its Association with Consumption of Iodized Salt among School Children, in a Rural Area, Tamilnadu

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Abstract

Background: Iodine Deficiency Disorders is a significant public health problem all over the world.Iodine is essential element for thyroid function, necessary for normal growth, development and functioning of brain and body. **Objectives:** To estimate the prevalence of goiter among school children and to assess the prevalence of useof iodized salt. **Material and Methods:** A Cross sectional study conducted among Children between 6-12 years of agein Mappedu area.A pre-tested questionnaire, Rapid test kit to find iodine content of salt and clinical examination to assess goitre was done for the study subjects.The sample size calculated was120.Dataanalysis:Proportions and chi-square was used for analysis. **Results:** 65% were using iodized salt and remaining 35% were using non-iodised salt.The prevalence of goiter was found to be 17(14.2%). **Conclusion**: One-third of children and their family were not consuming adequately iodized salt. The consumption of iodized salt is still less in the community and Iodine Deficiency Disorders continue to be a public health problem.

Key words: *IDD, Goiter, Iodized Salt, Rapid test kit.*

Introduction

Iodine Deficiency Disorders is known to be a significant public health problem all over the world. Iodine is essential element for thyroid function, necessary for normal growth, development and functioning of brain and body.Iodine deficiency is known to cause endemic goitre.[1]

Salt iodization programs is being implemented in many countries of the world for more than five decades ,currently only two-thirds of the global population (71%) is estimated to be covered by iodized salt, while the rest (31%) of the world population have insufficient iodine intakes, with the most affected WHO regions being South-East Asia and Europe.[2]

Iodine deficiency disorders are estimated to result in loss of 2.5 million disability adjusted life years (DALYs) (0.2% of total globally).[3] In India it is estimated that more than 71 million individuals suffer from Iodine Deficiency Disorder, while another 200 million people stay in iodine deficient areas.[4]The Iodine Deficiency Disorder control goal in India was to reduce the prevalence of IDD below 10% in the entire country by 2012.[5]

In Tamil Nadu, the IDD control cell was established with Central Government assistance and is functioning since 1st July 1994.Goiter surveys and resurveys of all the districts are being carried out periodically since 1991. According to National Family Health Survey (NFHS)-4 in Tamil Nadu proportions of households using iodized salt is 82.8%.TotalGoitre rate is reported as 13.5% in Tamil Nadu.[6]

Although the importance of iodized salt and its usage has increased in the community,Iodine deficiency poses a threat to health, wellbeing and economic productivity of the community.Progress toward the elimination of Iodine Deficiency Disorder can only be demonstrated if it is measured.

Monitoring iodine levels of salt and iodine status of population are the two important components of Iodine Deficiency Disorder program monitoring, hence the study has been conducted.

Objectives

1.To estimate the prevalence of goiter among school children in rural area.

2.To assess the prevalence of use of iodized salt among them .

Methodology

A cross sectional study was conducted in Primary School,Mappedu between May 2018 – July 2018. Children between 6-12 years of age were selected by using Simple Random Sampling method. The sample size of 120 was calculated by using 76.2% of households residing in rural area were using iodized salt.[7]Using a pre-tested questionnaire,details regarding edible salt used within the family was obtained. Children were asked to bring 1-2 teaspoon of salt which is used for cooking purpose at their home in a sealed plastic bag and Iodine content in salt wasestimated using Rapid Test Kit.

Children were clinically examined for the presence of enlargement of thyroid gland.Children who were not present in the school at the time of data collection and those who are not willing to participate were excluded from the study. Data was entered in MS Excel. Proportions and chi-square were used for data analysis.

Salt Sample Collection & Testing:

One teaspoon of salt was obtained from each household for testing purposes.Rapid test kit was used to estimate the iodine content of salt. [8,9,10]

- One to two drops of the test solution was put on the salt sample,if the colourchanged from white to blue/ purple, indicated the presence of iodine to threshold of 15ppm.

- For alkaline salt samples or salt with high moisture content, one drop of recheck solution followed by starch solution was used to test the presence of iodine in salt.

Clinical Examination:

Enlargement of thyroid gland was assessed and presence of goiter was graded as per WHO guidelines. [6,11]

- Grade 0: Thyroid gland was neither palpable nor visible/ no goiter.

- Grade 1: A mass in the neck that is consistent with an enlarged thyroid that is palpable but not visible when the neck is in normal position. The mass moves upwards with deglutition/goitre palpable not visible.

- Grade2: A swelling in the neck that is visible when the neck is in normal position and consistent with enlarged thyroid when the neck is palpated/goiter visible and palpable.

Operational Definition For Iodised Salt:

Iodised salt is defined as one which contains iodine content of ≥ 15ppm at the household level as determined by Rapid Test Kit.[12,13,14]

Results

120 children participated in the study, they belonged to 6-12 years age group mean age was found to be 9.14 years. Majority of them (50.8%) were using powdered form of salt. 80% of the study population were storing salt away from the fire.More than 90% of respondents have kept the salt in closed container.Majority of the households have bought packed type of salt 88.3% while 11.7% were found to purchase unpacked type of salt. (Table-1)

Table 1: Background Characteristics of Study Subjects(N=120)

BACKGROUND CHARACTERISTICS OF THE STUDY SUBJECTS (n = 120)			
S.NO	**CHARACTERISTICS**	**(N)**	**(%)**
1	AGE		
	6 years	18	15.0
	7 years	15	12.5
	8 years	14	11.7
	9 years	16	13.3
	10 years	18	15.0
	11 years	20	16.7

Cont... **Table 1: Background Characteristics of Study Subjects(N=120)**

	12 years	19	15.8
2	FORM OF SALT		
	Powdered	61	50.8
	Crystalline	59	49.2
3	PLACE OF KEEPING THE SALT		
	Kept near fire	24	20.0
	Kept away from fire	96	80.0
4	TYPE OF SALT BOUGHT		
	Packed	106	88.3
	Unpacked	14	11.7
5	STORAGE OF SALT		
	Open container	8	6.7
	Closed container	112	93.3

All the 120 children brought the salt samples from their houses. On testing the salt samples with Rapid Iodine testing kit 65% of the samples colour was changed to blue which indicate the presence of iodine≥15ppm. (Table-2).

Table 2- Distribution of Iodized Salt among Study Participants.

Iodine Content of Salt	N	(%)
Non-Iodized	42	35.0
Iodized	78	65.0
Total	120	100.0

Among the salt samples which the participants told they buy packed salt 70.8% were found to be iodised. While only 21.5% of unpacked salt was iodised. This difference was found to be statistically significant. (Table-3)

Table 3-Association between Iodine Contentof Salt and Types of Salt.

Type of salt	Iodized (%)	Non-Iodized (%)	Total
Packed	75(70.8)	31(29.2)	106
Unpacked	3(21.5)	11(78.5)	14
Total	78(100)	42(100)	120

*Chi square:13.225,P value: 0.000 ***P<0.05 is considered as significant.**

In the present study 61 salt samples were in powdered form and remaining 59 were crystalline. 70.5% of powdered salt was found to be iodised while 59.3% of the crystalline salt was iodised.This difference was not found to be statistically significant.(Table-4)

Table 4- Association Between Iodine Contentof Salt and Form of Salt.

Form of salt	Iodized(%)	Non-Iodized (%)	TOTAL
Powdered	43(70.5)	18(29.5)	61
Crystalline	35(59.3)	24(40.7)	59
Total	78(100)	42(100)	120

Chi square: 1.644,P value :0.199. ***P<0.05 is considered as significant**

Clinical examination was done among school children, the presence of enlargement of thyroid was checked and grading was done as per WHO guidelines. Goitre was diagnosed in 17 children. The prevalence of goiter was found to be 17(14.2%). Among those 17 children, 15(12.5%) of the children were found to have grade 1 and 2 children (1.7%) were found to have Grade 2 Goiter.(Table-5).

Table 5- Distribution of goitreamong the participants

Grading of Goiter	N	(%)
G0	103	85.8
G1	15	12.5
G2	2	1.7

Among 17 children who were clinically diagnosed to have goiter, 16 (94.2%) were not consuming iodised salt while only 25.2% children without any signs of clinical goiter were not consuming iodised salt. The difference was found to statistically highly significant.(Table-6)

Table 6- Association between iodized salt and goiter among study participants.

Iodine Content	Goitre Present (%)	Goitre Absent (%)	Total
Non-Iodized	16(94.2%)	26(25.2%)	42
Iodized	1(5.8%)	77(74.8%)	78
Total	17(100%)	103(100%)	120

*Chi square:30.42,P value : 0.000 ***P<0.05 is considered as significant OR= 47.**

Discussion

This study was carried out to assess the utilization of iodized salt in the rural community and prevalence of Clinical goiter.In the present study only 65% of the participants were consuming iodized salt which was less than reported by NFHS 4 in rural Tamil Nadu 76.2%.[7]

In our study 49.2% of the participants were using crystalline form of salt and 11.7% were getting unpacked salt.

The prevalence of goiter was found to be 14.2% in our study which was found to be similar to the results of national level survey data conducted by ICMR where the goiter prevalence was 14.1% (5-14 years age group).[15]Chandrakant et al reported 13.5% of school children showed enlargement of thyroid gland.[6] Zargar et al reported a higher prevalence of goiter30.2 % in children less than 6 years old and 50.6 % in children greater than 12 years old in Kashmir.[15]

In the present study all except 1 child who were diagnosed to have clinical Goiter were not consuming iodised salt. Odd's Ratio was found to be 47, this shows all those who were not consuming iodised salt were at 47 times greater risk of getting Goiter. Goiter is just one of the clinical manifestation of Iodine Deficiency Disorders,IDDs can also manifest as mental retardation, still birth, abortion, deafness, mutism, squint and neuromotor defects.[16]

More number of packed and powdered salt samples were found to be iodized in comparison to unpacked and crystalline salt. Indian government has issued the notification on banning the sale of non-iodised salt for direct human consumption in the country in May 2006 under the Prevention of Food Adulteration Act 1954.[17] In the present study one third of the families are found to consuming non-iodised salt. Therefore Government should take necessary actions to check the sale of unpacked salt and non-iodised crystalline salt in the market.

Conclusion

One-third of children and their family were not consuming adequately iodized salt. National Iodine Deficiency DisordersControl Programmewas startedfifty years back, but the consumption of iodized salt is still less and Iodine Deficiency Disorders continue to be a public health problem. Hence health education regarding Iodine deficiency disorders and adequate utilization of iodized salt is the need of the hour. Strict actionsshould be taken on the sale of non-iodised salt to have significant impact on the health and well-being of the country.

Limitation: The Urinary iodine excretion level was not estimated in this study.

Conflict of Interest: Nil

Source of Funding: Nil

Ethical Clearance: Ethical approval was obtained from the Institutional Review Board (IRB) and Institutional Ethics committee. Written informed consent was obtained from the parents of the study participants and information sheet regarding the study was given to all the participants.

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Health Care Facilities in Child Care Institutions in Delhi

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Abstract

UNCRC which is known as United Nation's Convention on the Rights of the Child has clearly distinct that an individual who has not accomplished 18 years of age is known as a child. The recent figures in the area of child rights shows that total child population in India is 472 million which makes thirty nine percent (39%) of India's entirety population [1]. Orphaned and destitute children in India are found to be 20 million [2]. Children who found in difficult circumstances are categorized in two categories that is Children who needs care and protection and who are conflict with law [3] and these children placed in custody of institutions where they stay for long period or short period which depends on the recognized need of the child. Children living in institutions or children homes necessitate basic care, health and educational services. These integration and rehabilitation functions must address needs of children and helps in removing challenges from their path of development. As endorsed in Juvenile Justice (Care and Protection) Act 2015 these institutions must follow standardized norms and provide services to cater the obligatory requisite to all children. The services include food, protected shelter, apt attire, remedial aid and other required service. The aim of this research study is to understand significance of the facilities provided to children with special reference to health care facilities in Child Care Institutions in Delhi.

Keywords: *Child Care Institutions (CCIs), Children in Need of Care and Protection (CNCP), Condition of Health, Health- facilities, Medical-care, Medical-services*

Introduction

In India population of the children (including 0-18 years) is estimated 472 million. According to National Institute of Urban Affairs (2016) in India 39% of the total population contains children. Even after end numbers of laws and policies have been implemented after the independence era the visible extreme poor condition of children can be seen through recent surveys and research studies. Children have equal rights but issues related to protection of children have always indeterminate and unaddressed matters of nation. The studies have shown that a huge number of children suffer abuse, neglect, unequal access to resources, poverty, discrimination, and homelessness despite of existence of laws and policies [6]. A number of researches have been taken up over a period of time to describe the deprived condition of children living in difficult circumstances in India. It is factual and so evident that children are dependent on adults primarily on their parents for their needs, growth and development. It is believed that family holds the primary responsibility of the child. Family caters all kinds of needs which comprise emotional support, physical care, psychological desires and economic needs of the child. A family is usually the most important and protective environment of the children (Richard Carter, 2005). Both bodies UNCRC and the Juvenile Justice (Care and Protection of Children) Act 2000 [3] mentioned that it is the prime duty of biological families of the children to help children grow in protected environment. Further it states that in deficiency of familial support it is the accountability of State to obligatory protects children who are underprivileged and destitute of family love and support [9]. All Children who by the law are identified in need of protection are located in institutions. The duration of the stay of children in these institutions can be up to days, months or years depending on the nature of each child case [4]. India's population of orphaned and destitute children is anticipated to be 20 million which reflects the needs of these institutions [3]. State plays a vital role in providing safe shelter to these children so that they must grow with their full potential. Special provisions are made in Juvenile Justice (Care and Protection) Act 2015 (abbreviated as J.J Act) which

promotes accurate rehabilitation and adaptation of children in society [5].

Understanding Children in Need of Care and Protection CNCP cases:

A child is known as a person below 18 years of his/ her age as mentioned in Convention on the Rights of the Child (abbreviated as CRC) but it is also noted that age of a child defined in diverse legislations pertinent to them in different circumstances [7]. A child who is in any circumstances like abused, working, orphaned, at families at risk, abandoned, differently abled, victims of sexual exploitation, on streets, beggars, affected by disasters, physically and mentally abused, drug falls under the purview of CNCP cases as mentioned in JJ Act. Cases of CNCP are hear by the proficient government organization namely Child Welfare Committee (abbreviated as CWC). CWC is a work surface of members wherein a chairperson and four members designate to exercise their rights in cases of CNCP. These members are proficient in their fields and every case of CNCP produces before the bench. The best interest of the child is main objective of the committee and keeping the needs of every case of the child it takes decision to return them to their original parents or custodian or to available suitable members of family. CWC issues certificate to child who is with permission is available for adoption in the cases where child cannot be placed in original family. There are also cases where child cannot be placed in family or family like environment thus child stays in children homes depending upon his/ her age and needs identified in the respective cases.

Significance of Child Care Institutions (CCIs):

The foundation of Child Care Institutions was laid down to address the challenges of children who live in extreme complicated circumstances and are in need of long term place of safety. It is widely measured as one of the best sources to rehabilitate children. Under the provisions of the JJ Act the term "child care institution" is defined as any home for children whether run by the government or non government authority or place of safety or specialized adoption agency and a fit facility intended to provide care and protection to children. The basic and fundamental function of all types of children homes is to address the developmental needs of the children. It means that CCIs are designated to grant physical, emotional, mental and educational facilities to all children. These children homes are endorsed to register under the act. It is mandatory to pursue the uniform rules and regulations defined in the act [8]. To regulate CCIs a provision of cancelation of the registration and punishment is given if the home violates rules, regulations and standard norms prescribed under the act. Children residing in homes are in need of rehabilitation and require integration in the society [11]. These institutions are being established to provide secure place of stay children, to address whole rehabilitation, to uphold physical and mental health and on the whole growth and development of all children.

Facilities provided in Child Care Institutions:

i. Basic and essential care facility:

Basic and essential care facilities provided in Child Care Institutions are meant to endow with basic necessities to children including safe accommodation, age and gender suitable garments, sufficient as well as healthy food, supervision and attention from the adults [10].

ii. Health care facility:

Providing proper medical assistance and taking care of children health is the most vital function of Child Care Institutions. The heath care services given to children includes: facilitate immunization as per their age, monitoring of physical growth and maintenance of the records, routine check ups and arranging visits of the doctors, taking children to doctors as and when needed, giving children medicinces on time, taking care of their diet and ensuring proper medical care.

iii. Educational facility:

Children living in CCIs are attending formal education. Every child has right to be admitted to school. Children who require extra attention bridge and tuition classes are arranged for them to ensure that no child would lack behind in education because of their past events.

iv. Counseling facility for psychological needs:

Child Care Institutions provide regular counseling sessions to all children which is done by a qualified psychologist to address and cater psychological and mental well being of every child in institutional care.

v. Recreational facility:

Child Care Institutions arrange and organize age suitable recreational activities such as dance, yoga, music, picnics, outings, sightseeing, monuments visits, educational visits, participation in cultural events, festival celebrations, national and international days celebration, birthdays celebration this further enlightening child's concentration and aptitude as well as provide children opportunity to explore and experience new world.

Objectives

- To understand the significance and facilities provided to children in Child Care Institutions in Delhi.
- To study the health care facilities provided to children residing in Child Care Institutions in Delhi.

Methodology

The study was undertaken to understand health care services provided to children who are staying in Child Care Institutions in Delhi. Integrated research approach using both quantitative and qualitative method is been adopted to gain better understanding of contemporary status of children in institutional care. A interview schedule (semi structured) was used as tools and techniques of data collection. Data analysis was done using thematic analysis also using Statistical Package for Social Science (SPSS) software.

The study was conducted in children homes in Delhi and included both types of children homes- NGO as well as government. The children who are in long term care were interviewed.

The sample was collected from 4 children homes out of which 2 were NGO homes and 2 homes were of government in nature. The sample sizes of 20 children- 10 male and 10 female from both children homes were approached. The children were from the age group of 10 - 18 years. A total number of 5 stakeholders working under heath care unit of the children homes were also interviewed to know the process of health care services.

Findings

Thematic Analysis:

Health of the children: It was found that at the time of the admission of children in institutions children are diagnosed with infirmity similar to skin diseases, fits, lower immunity, low weight, malnourishment and other diseases due to the inappropriate and harmful events occurred in their previous life prior coming to homes [12]. Children are found to be frequently ill and have complains of frequent fever, stomach pain, headache, etc, due to lower immunity system and malnourishment.

Heath care facilities in Child Care Institutions: Each child care institutions have medical staff including a full time nurse and a visiting physician. When children are admitted in child care institutions the medical staffs takes care of all the health related needs of the children and essential amenities are being provided. Children homes have both visiting as well as regular doctors and other staff to examine standard health check of children. The health care team or staff members are responsible to provide following services to all the children:

- Facilitating immunization as per the age of the child,
- Monitoring of physical growth including weight, height, head and chest circumference,
- Maintenance of the health records and individual files,
- Routine check ups,
- Arranging visits of the doctors in case of refer to special doctors,
- Taking children to hospitals as and when needed,
- Giving children medicines on time,
- Taking care of the eatery habit and diet of each child,
- Ensuring delivery of medical services to all the children.

Quantittive Analysis:

Relationship between health of the children and nature of children homes:

As this study covered both type of children homes government and NGO hence to find out the relationship between health of the children and nature of the children homes test namely Two sampled t test was applied.

Row Labels	Don't Know	Good	Not Good	Grand Total				
	Count	%age	Count	%age	Count	%age	Count	%age
Govt. Home	3	30.00%	4	40.00%	3	30.00%	10	50.00%
NGO Home	1	8.33%	8	83.33%	1	8.33%	10	50.00%
Grand Total	4	18.18%	12	63.64%	4	18.18%	20	100.00%

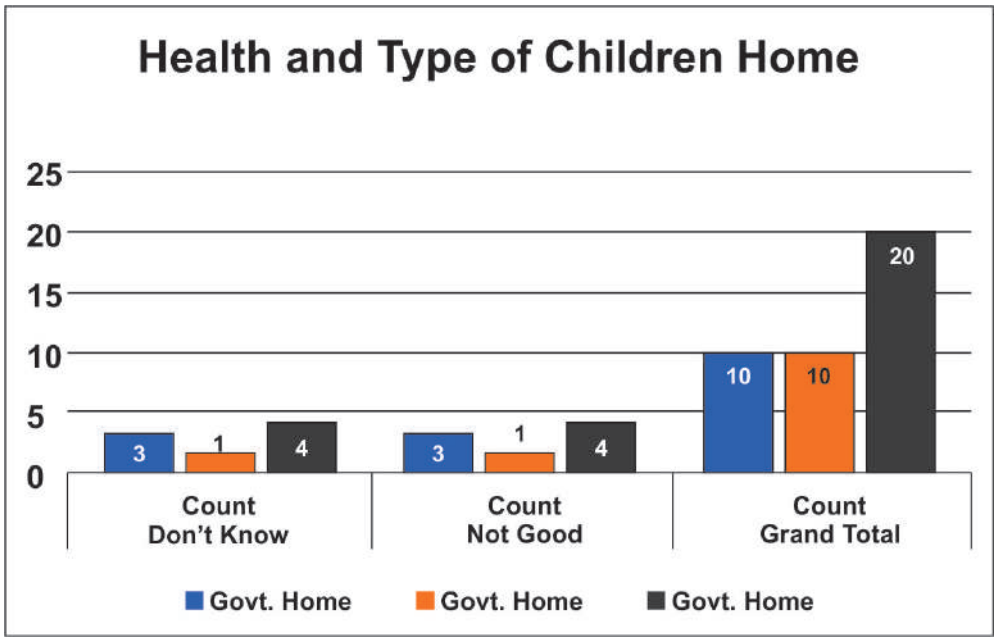
Name of the test - Two Sample t-test

t = 0.22086

df = 4

p-value = 0.418

95 percent confidence interval: (-5.768231,Inf)



The above mentioned data indicates no connection between health condition of children and the nature of children home. It further indicates that children in NGO home are evenly healthy as in children living in government homes. And the same health facilities are offered to children in both the homes.

Conclusion

The establishment of Child Care Institutions was initiated to save children from any type of complex and destructive situation and is considered as one of the finest mean to cater to the needs of children who are not in parental care due to some reasons and have need of safe- place, support and care which can be for long or short period of time depending on the needs identified by the competent authorities. It is known as fit facility for children. Child Care Institutions are approved and obliged to fulfill all requirements from giving basic facilities to health, a place of safety, and educational as well as emotional support to all children residing in these children homes. This study was conducted to understand health care facilities provided to children living in institutions covering both types of children home that is NGO and Government. Outcomes of the study indicate both the children homes that are government and NGO provides facilities to children and adhere rules and

guidelines as endorsed in JJ Act. It was found in the study that children who are admitted in Child Care Institutions gone through horrendous encounters occurred in their early period of life because of which they are more prone with sickness like fits, skin illnesses, worse resistance, low weight, malnourishment and others. Children when admitted to child care institutions their wellbeing needs are taken consideration by staff members and all essential and fundamental things is been given to them. There are ordinary and low maintenance specialists and staff medical caretakers who screen customary registration of the children. At the point when they fall ill they are taken to the medical clinics and hospitals by their caregivers. The information proposes that children in government home are similarly healthy as children living in NGO run homes. And the same health facilities are offered to children in both the homes.

Ethical Clearance: As part of the primary data, the data was collected under the PhD programme of Amity University by the PhD scholar from children living in child care institutions and stakeholders. The consent of the primary respondents was taken at the time of interviews and their identities remain confidential. Hence, data does not contain any identifiers and no ethical issues were involved in this research study. Therefore, no ethical clearance was taken.

Source of Funding: The data was collected under the PhD programme hence this research study is self financed by the PhD scholar.

Conflict of Interest: Nil

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Quality Assessment Using EFQM Model for Overall Excellence of Indian Health Care Sector

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Abstract

Quality point of reference is the main priorities of hospitals and quality assessments in hospitals is the biggest challenges which is determined by many tangible and intangible factors. The purpose of the paper is to investigate the quality assessment of hospitals in Odisha using the European Foundation for Quality Management (EFQM) model. Prior literature had focused on different sectors but less applicability of this model in the hospitals. In order to address the gap, the present research used a quantitative methodology to collect the data through a questionnaire from the healthcare professionals including doctors, hospital managers and Senior Executives in hospitals of Odisha. Random sampling was used where 87 respondents participated in this study. The results confirmed the significant contribution of the EFQM determinants in relation to each other .The results emphasis on the results of the EFQM model and it had both practical as well as academic contribution in the quality assessment in the hospitals and finally it has conclude EFQM model has played a vital role in influencing the quality assessment of hospitals.

Keywords: *Quality assessment, Healthcare, EFQM Model, Quality Management.*

Introduction

Quality has become a vital part of our day to day life. Quality as a tool is used by hospitals to gain a competitive advantage over competitors. By quality improvement it reduces waste, lower cost, market share is increased. Which in turn provides a hospital patient satisfaction and other stake holders in productivity and profitability. Health Care providers provide a variety of services various factors are taken into consideration in delivery of these services. Services have a multidimensional concept which specifies healthcare quality as the application of science and technology to maximize benefit to health without increasing risk. Quality service delivery is the most important priority of the hospital. Service quality and EFQM are most popular model implemented in the hospitals. EFQM most popular quality excellence model focus on continuous improvement organizational process. EFQM tries to improve service quality and is a tool helping hospitals to measure the path of excellence and helps in finding the gap and suggest for further improve or enhancement. EFQM model provides a total view approach, satisfies patients and its stakeholders, financial concern and self assessment instrument used in finding out the gaps in process improvement. This it is essential for the study of quality aspect in the hospital and implement model for excellence in health care delivery services.

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Literature Review: Vallejo et al (2007) used the EFQM model in a psychiatric ward and found EFQM model as a excellent framework for quality assessment and a good tools for identifying the areas for quality improvement. Only one criteria didn't apply to the ward out of the 232 sub criteria. The study was in Spain used quasi experimental research design using EFQM

model which aimed at quality by which the number in admission increased, length of stay and readmission process time decreased.[2]. TQM model was implemented to improve the quality standards of the Palestinian public and private hospitals [12].Implemented the EFQM model and the factors were extracted to measure the quality perceptions of health care organizations and measured the relationship between quality dimensions. Strong relationship was based on leadership, resource management, people management and customer satisfaction[9]. Moeller J (2001) used EFQM model in German health care services, the model was proven to a quality management tool to gain a competitive advantage [1]. Sanchez et al(2005) Studied in Spain using Observational Methodology used EFQM model. The study aimed at quality, efficiency. They found satisfaction level increased and average length of stay and waiting time for surgical is increased. The majority of EFQM criteria improved, especially noticeable in 'processes' and 'people results'[3].Leadership and employees greatly affect quality initiatives on success or failure in the healthcare organizations [10].Leigh et al(2005) study in UK using Survey methodology EFQM model Qualified nurses Confidence, competence and retention of newly nurses increased.[4]. Rodriguez Cerrillo et al. (2002)in Spain used quasi experimental with ISO 9001. The result outcome was patient satisfaction improved[5]. Excellence Organizational Model of European Foundation for Quality Management has been on nine criteria [7]. They proposed a model which include four stakeholders i.e. patients, activities, resource and their effects. They used six levels and the model proposed by them was compatible with other models [8]. The 9 principles of EFQM model are Leadership, Policy and strategy, People, Partnership and resources, processes, customer results, people results, society results and key performance results. EFQM model implemented in thermal sector in order to improve the excellence in quality [11]. Human resources and customer results should be given more emphasis for improving the organization excellence model [6].

Research Objectives:

1. To find out the factors which determines the EFQM model in hospitals in India.

Materials and Method

Descriptive research design is used in the study. The population in the study was the hospitals in Odisha and the samples was confined to the health care professional including doctors, senior executives, top management A total of 87 questionnaire was found to be correct Respondents 45% were male and 55% were women and belonging to age group consisting of 18% of respondents having age between 24 to 29 years whereas maximum respondents belonged to age category 40-49 years. 80% of respondents had master degree and having job experience of more than 10 years.

Assessment of Hospitals using the SCORE of EFQM:

a. Leadership: Hospitals showed the score in between the range of 55 to 67 points.

b. Policy and Strategy: Hospitals showed the score 65,66,54

c. People: The scored varied between 45 to 56

d. Partnership & resources: Hospitals showed score between 52 to 67

e. Processes: Scored varied between 75 to 96

f. Customer result: Score varied between 130 to 160 out of 200.

g. People result: Score varied between 55 to 78 out of 90.

h. Society Results: Highest among all the hospital was 56.

i. Key Performance Results: The highest score was 126 among all the hospitals

Correlation matrix specified the e correlation between the various parameters of the EFQM model and their relationship positive relationship exists between the variable towards the EFQM.

Table 1: Regression Analysis

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.797[a]	.635	.622	.650
a. Predictors: (Constant)				

The R^2 square specifies 63% explained by the variables towards the performance results and the society result and people results.

Table 2: Regression Coefficients

Oefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.728	.408		9.139	.000
	Customer Results	.234	.044	.187	-3.084	.000
	People Results	.155	.053	.068	-1.033	.003
	Society Results	.443	.045	.471	7.638	.000
a. Dependent Variable: Key Performance results						

Table 3: Regression coefficients

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.738	.400		9.348	.000
	Policy & Strategy	.369	.043	.497	8.632	.000
	People	-.224	.055	-.230	-4.098	.000
	Partner & Resources	-.073	.044	-.090	-1.676	.005
a. Dependent Variable: Processes						

Discussions

The above table specified the correlatinship-which is represented as the correlation matrix. 9 factors of the EFQM model was suggested i.e. leadership, policy & strategy, people & partnership and resources, process, customer results, people results, society results and key performance results. Positive relationship was established between leadership and policy strategy, positive relation is shown between leadership and people, positive relationship between partnership and resources. Policy and strategy have a positive impact on process. Leadership influences the policy strategy, people and partnership resources. So, it very much essential for the managers to understand these factors and to know to what degree leadership can influence the strategy formulation and people and partnership resources. Knowledge of different stakeholders should be known as per that policy and strategy has to be formulated. In order to achieve excellence in hospitals people have to be involved. Partnership and are aligned with strategic alliances and that gives more value to the chain. Key performance results in the hospitals are linked with customer, process and people results. The results obtained are being compared with EQA (European quality association) benchmark scores and the hospitals selected in the study have the score above the average score of EQA. The process, customer and key performance results showed a difference among them. Society results had been below the average score of EQA. The EFQM model criteria are being divided into enablers and results and there a strong causality between the enablers and the results criteria as being found in the study. The identify excellence factors are leadership, partnership and resources, policy strategy, people and processes. These criteria perform the operational excellence in the hospitals. Patients are important than stakeholders,employee,partners. Not only processes, performance, are important but also patients are very important for the excellence in the hospitals.

Conclusion

The study focused on implementing the EFQM model in hospitals and it had a strong contribution in the way of EFQM in the health care sector. The study done in hospitals tried to fill the gap between various parameters on the basis of results. Society, key performance results, people results are the different variables focusing on the quality in hospitals. EFQM focused on improving the organization performance results. The study would help the hospital managers, administrators and the top management in understanding the parameters and implementing it for the success of the hospitals growth. Different strategy can be implemented in improving

the overall growth of the organization by which in turn improving the patient care quality.

Ethical Clearance: Not Required (It does not involve any experimental data collected from human as well as Animals. The data is collected from healthcare professionals working in different hospitals which purely their personal view or opinion which does not violate the ethical standards.)

Source of Funding: Self

Conflict of Interest: Nil

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A Modified Technique for Establishing the Occlusal Plane in Complete Denture Prosthesis

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Abstract

Occlusal plane position is considered to be the primary link between function and esthetics. Canted occlusal planes result from the canted interpupillary line if the latter issued as reference plane. Establishing this occlusal plane correctly by orienting is of prime importance. Bubble gauge mounted to the fox plane provides more accurate orientation of occlusal plane irrespective of reference planes. This modification can be used to achieve optimum result in facial asymmetries and canted interpupillary lines, since interpupillary line cannot be used as a guide in such cases.

Clinical Implications: If a clinician uses bubble gauge-fox plane approach for establishingocclusal plane, then the aesthetic outcome will be enhanced. This method is also of value since it reduces subjective variations.

Keywords: *Occlusal cants, reference planes, complete denture esthetics, interpupillary line.*

Introduction

Occlusal plane is the average plane established by the incisal and occlusal surfaces of the teeth. Generally, it is not a plane but represents the planar mean of the curvature of these surfaces[1]. The orientation of the occlusal plane is lost in patients rendered edentulous and should berelocated if complete dentures are to be esthetic and to function satisfactorily. It is the most important plane to be determined in complete denture work, as it is a vital and importantbasis for tooth arrangement[2]. Complete dentures are constructed to function in the mouth asan integral part of the masticatory system; therefore, they should be designed to conform to the patient's physiologic jaw relations. The plane of occlusion forms one essential physiologic concept of jaw relation and occlusion. A well contoured occlusal rim with occlusal plane parallel to ridge posteriorly and parallel to interpupillary line anteriorlystabilises the denture3.

During the maxillomandibular relations after forming the rim with the correct vertical heights, the plane of occlusion is modified until it is parallel with a line projected from ala of nose to the superior edge of the tragus of ear (Camper's line). The incisal-canine esthetic line should be made parallel to the interpupillary line when the patient is looking straight ahead[2,4,5,6].

An occlusal plane indicator such as a Fox plane guide is used to achieve this goal[7]. In practice, a metallic scale is used along with Fox plane[8,9,10]. The Fox plane is placed inside the mouth touching the occlusal rim and is held by the operator, while the metal scale is held at the level of Camper's line or interpupillary line. Conventional method have the following disadvantages:

It is difficult to hold the scale steady. The scale position changes every time the operator checks the parallelism. Moreover, when checking with naked eye, the operator has to be at eye-level to check the parallelism as any change in angulation of eye leads to incorrect results. This not only increases the chances of error but also makes the procedure tedious and time-consuming. Trying to imagine the interpupillary line and

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comparing it with the Fox plane guide is quite difficult. It is difficult for the practitioner to compare between the fox plane guide and an instrument that represents the interpupillary line with a distance of several centimetres apart. It is difficult to fix or stabilize the pupils because the patient doesn't understand the importance of stabilizing the pupils, nor does he/she know in which correct position to stabilize the pupils. In elderly subjects who receive the majority of the complete dentures the muscle coordination is poor[3].

A range of facial asymmetries can influence the choice of occlusal plane duringprosthodontic treatment. Thus, an occlusal plane parallel to the ala tragus and interpupillary lines, as often supported by prosthodontists, may result in less than ideal esthetics in the final restoration[11,12].

In the event that one eye is higher than the other (which often occurs), the incisal-canine line would be made slanted in relation to true horizontal when the patient's head is erect. The interpupillary is not the best esthetic reference line and has advocated making the incisal-canine line parallel to horizontal when the patient's head is perfectly erect regardless of the eyes or any other facial feature[13].

To overcome the above disadvantages a modification to the Fox plane in which, bubble gauge is mounted to the Fox plane (Fig 1). The bubble gauge consists of coloured liquid in a tube consisting of bubble and markings in the centre. The presence of the bubble in between the markings indicates that the surface is parallel to ground level or the truehorizontal[14]. Bubble gauge is used in automobile industry, water level monitoring etc.

Applying the same principle to complete denture prosthodontics, it can be used inmaxillomandibular relations procedure where the planes are of utmost significance.

Procedure for use of bubble gauge: The patient is made to sit erect looking straight ahead at horizon. The labial form of occlusal rim should provide adequate lip support and labial fullness. The vertical length of the maxillary occlusion rim is established. The occlusal plane is adjusted using the centralisation of bubble in between the markings as a guide (Fig 2). The procedure is carried out independent of the interpupillary line.

Fig 1: Mounted bubble gauge on fox plane

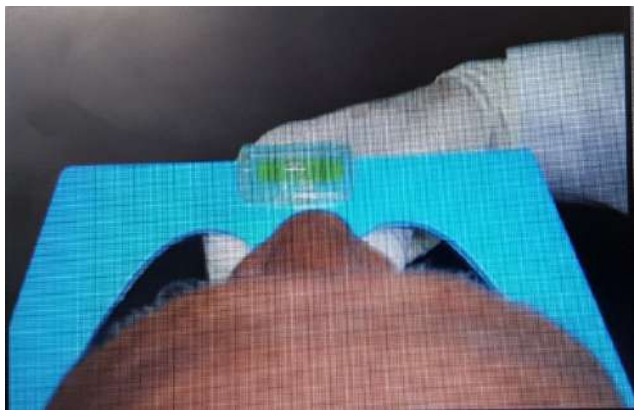

Fig 2: Centred bubble gauge

Discussion

Several method for the determination of occlusal plane have been proposed[15,16,17,18]. Conventional method have their inherent demerits. This modification is simple and inexpensive. It is very easy to use for the beginners. Need to be at eye level is eliminated and hence the chances of change in the angle of operator eye level leading to incorrect plane of occlusion are nil. This method is of advantage in cases with facial asymmetries and canted interpupillary lines. The practitioner would not need to imagine or try to present the interpupillary line with any instrument. Posture of the patient can bring about changes in the position of bubble. So the patient is made to sit erect looking straight ahead at horizon. When mounting the bubble gauge to the Fox plane, it should be done on a flat base as any inclination in surface can lead to incorrect mountings.

Conclusion

Arranging the teeth in the correct plane of occlusion is important for the success of complete denture prosthesis. This modification is thus reliable alternative

method for the orientation of the occlusal plane and can be used with less subjective bias than that of the conventional method utilizing the interpupillary line

Conflict of Interest: None

Source of Funding: Self funded

Ethical Clearance: Ethical Clearance was not required hence so was not obtained

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To Evaluate the Hypnotic Doses of Etomidate and Propofol Using Entropy Monitor and to Determine their Hemodynamic Response During Laryngoscopy and Intubation

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Abstract

Background and Aims: Aim of this study was to compare the doses of Propofol and Etomidate using Entropy Monitor and per kilogram body weight doses and hemodynamic effects of both the drugs after induction and intubation.

Material and Method: Hundred patients of ASA grade I and II in the age group of 18-60, scheduled for elective surgery under general anesthesia were randomly allocated in two groups. In group A: Induction dose of Etomidate was given till Entropy reached value of 40. In group B: Induction dose of Propofol was given till Entropy reached a value of 40. The doses given in ml were noted and calculated. Hemodynamic parameters like SBP, DBP, MAP, heart rate, oxygen saturation (SpO2), end tidal carbon dioxide were noted at baseline, induction, 1 min, 2 min, 3 min, 4 min, 5 min and 10 min thereafter. Data was subjected to statistical analysis.

Results: There was reduction in induction doses using Entropy guided hypnosis level. The mean dose of Etomidate according to entropy was 16.9±2.8mg (0.27mg/kg) and per kilogram body weight dose was 18.61±3.4mg (0.3mg/kg). The mean dose of Propofol according to Entropy was 108.8±17.6 mg (1.72mg/kg) and per kilogram body weight dose was 124±23.1mg (2mg/kg). Incidence of hypotension and tachycardia was more with Propofol than Etomidate

Conclusion: Use of Entropy resulted in decrease in the dose of Etomidate and Propofol. Etomidate provides more hemodynamic stability than Propofol after induction and intubation.

Keywords: *Entropy monitor, hypnotic doses, hemodynamic response, Propofol, Etomidate.*

Introduction

Propofol and Etomidate can be used as an induction agent alone or for both induction and maintenance during general anesthesia.[1,2,3] Earlier loss of verbal commands and eyelash reflex were used for assessing awareness. But these end points are not accurate. For assessing depth of anesthesia newer monitors are now available which helps in preventing awareness from inadequate doses and side effects from higher doses. These monitors include spectral entropy, bispectral index and narcotrend.[4,5]

Datex-Ohmeda module calculates two separate entropy values over variable time duration. State entropy has frequency of 0.8 to 32 Hz and its index ranges from 0 to 91. It reflects the cortical state of

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patient. Response Entropy has a frequency range of 0.8 to 47 Hz and its index ranges from 0 to 100 and is an indicator of analgesia.[6] Readings between 40 and 60 are considered as satisfactory level of anesthesia. This is the point where awareness can be avoided and unnecessary prolongation of recovery is also prevented. Adequate level of anesthesia is considered when values of RE and SE are identical.[7]

In this study we aim to assess the hypnotic doses of Etomidate and Propofol using entropy for laryngoscopy and intubation and also determine their hemodynamic effects during induction and on endotracheal intubation.

Material and Method

After obtaining approval from the Institutional Ethics Committee with IEC approval number- 613 and a written informed consent from all the patients, this prospective randomized comparative study was conducted for 2 years on 100 healthy adult patients, aged 18-60 years, of ASA grade I & II, who were scheduled to undergo elective surgical procedure under general anesthesia. Patients with hypertension, cardiac, hepatic and renal disease, respiratory distress, diabetic patient, epilepsy, pregnant patients, MP grade III and IV were excluded from study. 100 healthy patients were randomly allocated in two groups each. **Group A:** (n=50) Induction dose of injection Etomidate was given intravenously till entropy of 40 was achieved. **Group B:** (n=50) Induction dose of injection Propofol was given intravenously till entropy of 40 was achieved. Preanesthetic evaluation was done a day prior to surgery and all investigations were carried out. All patients were kept fasting for 8 hours. After ascertaining that the patient was fit for surgery, a written informed consent was taken. In OT, IV line was secured with 18 G cannula and normal saline was started. Monitors were attached. Baseline vitals SBP, DBP, MAP, HR, SpO_2 and EtCO2 were noted. Study drug was prepared according to the groups allocated randomly by a computer generated randomization. Patient was given injection Glycopyrrolate 0.2mg/kg and injection Fentanyl 2mcg/kg intravenously and pre oxygenated with 100% oxygen via face mask for 3-4 minutes. Anesthesia was induced with IV induction agents (Propofol/Etomidate), as per study group, while observing entropy. Hypnotic dose was noted when entropy reached a value of 40. After ensuring adequate mask ventilation, neuromuscular blockade was achieved with injection vecuronium 0.1mg/kg followed by laryngoscopy and endotracheal intubation. After confirming correct position of ETT, anesthesia was maintained with oxygen and nitrous oxide (40:60), sevoflurane (0.5-1%) and intermittent top ups of injection vecuronium (0.02mg/kg) with controlled ventilation. SBP, DBP, MAP, HR, SpO_2, and $EtCO_2$ were noted at induction and 1, 2, 3, 4, 5, 10 min thereafter. On conclusion of surgery, patient was reversed and provided 100% oxygen via venturi mask. The dose was calculated in mg from the noted volume of drug (ml). Any perioperative side effects such as hypotension, bradycardia, hypertension, tachycardia, myoclonic jerks, and seizures, pain on injection, bronchospasm or laryngospasm, nausea/vomiting were noted. Data from above study was systematically collected, compiled and statistically analyzed to draw relevant conclusion. This study did not impose any financial burden to participants.

Results

Demographic profiles of patients in both the groups were comparable with respect to the age, gender, weight, ASA physical status, Modified Mallampatti Classification**.** In comparison of Mean arterial pressure in both groups at different time intervals statistically significant fall in MAP was observed in Group B as compared to Group A at T_1, T_2 and T_3 (p-value = <0.005). After laryngoscopy statistically significant rise in MAP at T_5 in group B compared to Group A (p-value = 0.000) [Table 1].

Baseline heart rate was comparable among groups. Mean HR in group A was 79.16±10.241 and in group B was 78.12±9.115 (p-value = 0.593). Statistically significant rise in HR was seen 1 minute after laryngoscopy and intubation in group B (mean 99.7±13.0) but no significant rise in group A (mean 94.1±10.2), p-value calculated was 0.018 [Table 2].

The mean dose according to entropy (DE) in group A was 16.9±2.8 and according to per kg body weight (DW) was 18.6±3.4 (p-value = 0.000). There was a statistically significant difference in the induction dose in Group A when calculated according to entropy and per kg body weight. As evident from the table mean dose according to entropy (DE) in group B was 108.8±17.6 and according to per kg body weight (DW) was 124.3±23.1 (p-value = 0.000), which showed statistically significant difference in induction dose in Group B when calculated according to entropy and per kg body weight [Table 3].

Incidence of high blood pressure (HBP) was 29% in group B and 12% in group A. There was a statistically

significant difference (p value=0.000) between two groups. Incidence of low blood pressure (LBP) was 60% in group B and 10% in group A and this was found to be statistically significant (p-value = 0.000). Incidence of tachycardia (Tc) was 18% in group A and 38% in group B (p-value = 0.026). Incidence of bradycardia (Bc) was 0% in both groups [Table 4].

Adverse effects of Etomidate and Propofol were also noted in our study. Myoclonus was observed in 16% patients with group A and none with group B. There was a statistically significant difference (p- value=0.000) between two groups. Pain on injection was observed in 42% patient receiving group B and 0% with groups A. There was a statistically significant difference (p value=0.000) between two groups. Nausea and vomiting was seen in 6% patients with group A and only 2% with group B and this was neither clinically nor statistically significant (p-value = 0.610) [Table 5].

Table 1: MAP in both groups at different time interval

Time Interval	Group A (n-50)		Group B (n-50)		T	df	p-value
	Mean	SD	Mean	SD			
T	89.7	9.2	90.7	10.2	-0.552	98	0.582^{NS}
T_0	93.4	8.4	95.1	8.9	-1.012	98	0.314^{NS}
T_1	85.9	10.0	75.5	8.0	5.704	98	0.000*
T_2	86.2	7.8	76.6	6.1	6.798	98	0.000*
T_3	87.3	6.9	82.4	5.4	3.926	98	0.000*
T_4	88.2	5.5	86.9	6.7	1.031	98	0.305^{NS}
T_5	98.4	8.1	105.3	9.1	-4.006	98	0.000*
T_{10}	89.0	4.3	88.2	6.4	0.707	98	0.481^{NS}

NS- Non significant, *- Significant value, T- Baseline, T_0- At the time of induction, T_1-T_3 - 1min, 2min and 3 min after induction respectively, T_4 - Laryngoscopy time, T_5 - 1min after laryngoscopy, T_{10} - after 10 min.

Table 2: Heart rate distribution in both groups at different time period

Time Interval	Group A (n-50)		Group B (n-50)		T	df	p-value
	Mean	SD	Mean	SD			
T	79.1	10.2	78.1	9.1	0.536	98	0.593^{NS}
T_0	83.2	8.9	85.0	10.3	-0.910	98	0.365^{NS}
T_1	83.6	9.1	84.9	10.5	-0.687	98	0.493^{NS}
T_2	83.8	9.1	84.7	9.6	-0.448	98	0.655^{NS}
T_3	84.0	8.6	85.6	8.9	-0.898	98	0.372^{NS}
T_4	83.6	7.8	86.2	7.9	-1.640	98	0.104^{NS}
T_5	94.1	10.2	99.7	13.0	-2.407	98	0.018*
T_{10}	83.4	6.2	77.1	8.8	4.160	98	0.000*

NS- Non significant, *- Significant, T- Baseline, T_0 - At the time of induction, T_1- T_3 - 1min, 2min, 3 min after induction respectively, T_4 - Laryngoscopy time, T_5- 1min after laryngoscopy, T_{10} - after 10 min.

Table 3: Distribution of DW and DE in both the groups

	Group A (Etomidate) n-50		Group B (Propofol) n-50		p-value
	Mean	SD	Mean	SD	
DW	18.6	3.4	124.3	23.1	0.00*
DE	16.9	2.8	108.8	17.6	0.00*

DW- Drug dose according to per kg body weight, DE- Drug dose according to Entropy, SD- Standard deviation, *- Significant value.

Table 4: Distribution of patients according to (HBP, LBP) (Tc, Bc)

	Group A (Etomidate) n-50	Group B (Propofol) n-50	p-value
HBP (percentage)	12	29	0.000*
LBP (percentage)	10	60	0.000*
Tc (percentage)	18	38	0.026*
Bc (percentage)	0	0	-

HBP- High blood pressure, LBP- Low blood pressure, Tc- Tachycardia, Bc-Bradycardia, *- Significant value

Table 5: Distribution of patients according to adverse effects

	N	Group A(n-50)		Group B(n-50)		X^2	df	p-value
		F	%	F	%			
PIV	21	0	0.0	21	42.0	26.582	1	0.000*
Mc	8	8	16.0	0	0.0	6.658	1	0.010*
Sz	0	0	0.0	0	0.0	-	-	-
AR	1	0	0.0	1	2.0	0.000	1	1.000NS
ARR	0	0	00	0	0.0	-	-	-
N/V	4	3	6.0	1	2.0	0.260	1	0.6l0 NS

NS- Non significant, *- significant value, PIV- Pain in injection, Mc- Myoclonus, Sz- Seizures, AR- Adverse Reaction, ARR- Arrythmias, NV- Nausea/Vomiting

Discussion

In our study we have used Entropy monitor to calculate the hypnotic dose of Etomidate and Propofol. Entropy monitor gives us combined state of adequate muscle relaxation, adequate pain suppression and adequate hypnosis.

Demographic profile of patients in both groups was comparable with respect to age (p-value = 0.868), gender (p-value = 0.548) and mean weight (kg) distribution (p-value = 0.843). Demographic profile done by **K Meena et al** also had comparable age group (p-value = 0.178) and comparable gender distribution (p-value = 0.241).[8]

In our study baseline MAP was comparable in both groups. Mean MAP in group A was 89.7±9.2 and in group B was 90.7±10.2. After induction there was fall in MAP in group B but no significant fall in group A. Mean MAP 1 min after induction in group A and B was 85.9±10 and 75.5±8 respectively. After laryngoscopy MAP in group A and B was 98.4±8.1 and 105.3±9.1 respectively.

Shah SB et al compared hemodynamic effects of Propofol and Etomidate after induction, laryngoscopy and intubation and concluded that there was significant fall in MAP after induction with Propofol compared to Etomidate. Baseline MAP in Etomidate and Propofol group was 98.03±9.58 and 97.43±5.67 respectively. 1 min after induction the MAP in Etomidate and Propofol group was 82.47±8.23 and 73.10±9.98.[9] **Bendel SI et al** compared fall in MAP after induction with Propofol and Etomidate and found out that the decrease in mean blood pressure was more with Propofol (p-value = 0.006).[10] In our study no significant change was seen in SpO_2 between two groups (p-value = >0.05). In our study $EtCO_2$ varied from minimum 35mmHg to 45mmHg maximum. This was statistically significant at various time intervals but changes in EtCO2 are not clinically significant and therefore no clinical intervention was required. **Singh R et a1** studied that the increase from baseline in heart rate was significant (p= 0.001) at 1 minute after intubation.[11] In our study the baseline heart rate was comparable among groups. Mean HR in group A was 79.16±10.241 and in group B was 78.12±9.115, p- value calculated was 0.593. Statistically significant rise in HR was seen 1 minute after laryngoscopy and intubation in group B (mean 99.7±13.0) but no significant rise in group A (mean 94.1±10.2), p- value calculated was 0.018.

In our study induction doses of Etomidate and Propofol were compared separately in different groups using entropy monitor and per kilogram body weight

doses (0.3mg/kg for Etomidate and 2 mg/kg for Propofol). We found out that the doses were significantly reduced in both the groups when entropy monitor was used. Mean dose per kg body weight in group A was 18.61 but mean dose with entropy was l6.98 (p-value = 0.00). Mean dose per kg body weight in group B was 124.32 and mean dose according to entropy was 108.80 (p-value = 0.00).

Arya S et al in 2013 studied clinical versus EEG guided Propofol induction. According to this study mean dose of Propofol when given clinically was 1.85±0.48 mg/kg and 1.79±0.41 mg/kg when it was guided by BIS which was comparatively lesser.[12] **Raid et** al did a study on entropy guided Propofol induction in 72 elderly patients and total dose of Propofol and per kilogram body weight dose were significantly reduced by 37.1% and 31.8% respectively in entropy group. They found out that with the use of entropy, dose was reduced and recovery was faster when compared with control group.[13] High blood pressure was observed in 29% patients in Propofol group and 12% patients in Etomidate group. Low blood pressure was observed in 60% patients in Propofol group and 10% patients in Etomidate group. Tachycardia was present in 38% patients in Propofol group and 18% patients in Etomidate group. No incidence of bradycardia was seen in both groups.

Myoclonus was observed in 16% patients with Etomidate and none with Propofol. Pain on injection was observed in 42% patients receiving Propofol and 0% with Etomidate. Nausea and vomiting was seen in 6% patients with Etomidate and only 2% with Propofol. Adverse reactions were found in 2% patients with Propofol and 0% with Etomidate.

Miner et al concluded higher incidence of myoclonus (20% vs 1.8%) in Etomidate and Propofol groups respectively. Pain on injection was observed only in Propofol group.[14]

Ethical Approval: This clinical study has been approved from the institute ethics committee with IEC approval number-613.

Conflict of Interest: Nil

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A Study on Work Life Balance and Stress of Female Employees in IT Sector: A Study with Special Reference to Employees in Chennai

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Abstract

The main aim of this study is to find the work life balance and it causing stress among the female employees working in IT sector. The primary data is collected by using primary method such as questionnaires. For this study questionnaires are used to collect primary data from the respondents. Factor analysis is used to find the result by the researcher. The results shown that Work-life-balance is an important issue in IT profession. In today's competitive era, with changing demands, regulations and so much pressure the work needs have increased a lot. This leads to increase in stress level of the female IT employees .Majority of the respondents expressed that there is no separate policy for work life balance in their organisation and many people were doing work overtime.

Keywords: *Work life balance, Stress, Job Performance.*

Introduction

Every individual is an integral part of the family in particular and the society in general. In today's business world, employee performance is key determinant in the achievement of organizational goals. As a result, organizations look for different ways of motivating their employees, in order for them to give their best to the organization. Employee performance is a focal point in any establishment. Every policy should be geared towards increasing the employee performance. For organizations to remain on top they should be able to improve their employee performance and monitor it. In a situation where this does not occur, they are liable to face several challenges which stands as a set back to the organization in the sector where they belong.

Work life balance is a very important phenomenon that is of great concern to various employees in both private and public sector. It goes beyond prioritizing the work role and one's personal life. It also affects the social, psychological, economical and mental well being of the individual. All these is been reflected in the output of the individual, which affects his or her performance in the work place on the long run. Work life balance has implication on employee attitudes, behaviours, wellbeing as well as organizational effectiveness (Eby, Casper, Lockwood, Bordeanx and Brindley, 2005). The competition for market leadership in the banking sector, may lead to bank managers giving their employees excessive work load in order to meet up with their target. Employees try their best to be retained in the organization by putting in more time at work which may be at detriment of their personal life. All these may affect the upbringing of children, lead to broken and unhappy homes and poor social life.

The conventional wisdom indicates that a happy worker is a better worker. But it seems that the employers find it difficult to understand this fact. We all experience pressure on a daily basis. We need it to motivate us and enable us to perform at our best. However, when the pressure becomes excessive, it leads to stress. Many of the stressful life events are related to the workplace, e.g. lack of job security, changes in working hours, changes in working conditions, layoffs, downsizing, organizational readjustments, etc. IT industry in India has long been exempted from labour regulations in order to facilitate its rapid growth and competency in the global market. Although this is a sound argument in the wake of our

developing economy struggling to sustain and expand economic growth, yet it needs to be checked whether the burden is not being borne by the industry's labour force.

The recent past is a witness to changes in work schedules. A larger part of the IT sector is hence moving from a standard eight-hour a day regime to operating twenty four hours a day for seven days of the week. Many employees need to work on Saturdays and Sundays too. Moreover, there is a changing pattern in the working hours which is quite different from the standard one, which normally operates from 9 am to 5 pm. While some employees work in the standard time some others need to be available for work that normally starts early in the evening and continues well through the night. Sometimes they need to even work beyond the normal eight hours. Increasing workloads have pressurised employees to demonstrate their commitment to work in more obvious ways. Consequently, a larger part of them have tended to be present at their work place for longer periods of time, thereby reducing the time for which they are available at home.

Employees who start to feel the pressure to perform are likely to get caught in a downward spiral of increasing effort in order to meet rising expectations but no increase in job satisfaction. The internet and mobile phones have made it possible for the organizations to keep in constant touch with the employees both during the day and at night. To a large extent in the IT sector, the employee is expected to be engaged on the job almost at all times. Consequently, there are growing reports of stress and work imbalance. The constant requirement to work at optimum performance takes its toll in job dissatisfaction, employee turnover, reduced efficiency, illness and even death in some cases. Absenteeism, alcoholism, bad or snap decisions, indifference and apathy, lack of motivation or creativity are all by-products of an over stressed workplace. So the distinctions between work-life and family-life have vanished.

Review of Literature: Chassin et al. (1985) found three types of conflicts in their research on a sample of 83 working parents who have pre-school kids. These differences were related to (a) the demands of multiple roles, (2) between role expectations of self and spouse, and (3) lack of congruence between expectation and reality of roles[4].

Frone et al. (1992a) in their randomly drawn sample of 631 comprising 278 male and 353 female respondents also found that work to family conflict is more prevalent than family to work conflict. Their study suggested that family boundaries be more permeable to work demands than are work boundaries to family needs[8].

Bachmann (2000) found that work arrangements such as flexi-time, telework ethic are depicted as an important component of an individual's work preference towards work time. There is a suggestion that such work arrangements will help the employee achieve a better blend between their work and non-work activities. This will assist the organizations recruit, retain and motivate their workforce[1].

Hochschild (1997) has observed that to enhance commitment to an organization, the promotion of work life balance policies is of a compulsory interest to the governing body[10].

Burke (2002) noted that an organization that supports work life balance is preferred by both women and men. The benefit for Men appeared to be more than women. Satisfaction was more for Men when their achievement in job was more even at the cost of ignoring the family. On the other hand, women emphasized the need to strike a balance between work and family sources for their gratification. Women feel unhappy, disappointed and frustrated when work prevents them from taking care of their family. Women do not like the crisscrossing of the boundaries between work and home[3].

De Bruin and Dupuis, (2004) and Greenblatt (2002), emphasized the integration of the work and non-work roles of employees. Then the levels of multiple-role conflict, and the associated stress and job-dissatisfaction, can be minimized or avoided[5].

Doherty (2004) in the study on working life balance initiatives for women in the hospitality industry explored the main barriers to advancement into managerial roles. It was found that managerial roles called for long working hours[7].

Grady and McCarthy (2008) in their study defined that work-life integration is an outcome of the complex relationship between the dynamics of employment and personal factors. They found the balance between work and life is achievable through the funding and coordination of multiple activities which included the organization's interest. Children were given first priority by the respondents exhibiting a deep sense of motherhood. Factors like work stimulation, challenges, achievement

and enrichment were given high importance and sought more self-care time to balance work and family[9].

Baral (2010) studied 485 employees working in varied organizations in India found that working men and women in India experience more work family enrichment than the work family conflict. It was also found that there were no gender differences in the employee perception of work family enrichment[2].

Desai et al (2011) found that home-based working women had less stress, able to adjust better and were more satisfied with their careers[6].

Objectives of the Study:

- To find out problems faced by women employees in IT sector
- To determine the factors affecting work-life balance and causing stress
- To examine the effect of work life balance on Job performance

Hypothesis of the Study:

1. There is no significant difference among the factors influencing work-life balance.
2. There is no significant impact of Work life balance on the Job performance of the female employees.

Research Methodology: Research methodology is a method to solve the research problem research systematically. It involves gathering data, use of statistical techniques, interpretations and drawing conclusions about research data. Keeping in view the objectives of the study, data is collected from the following sources. Source of data are:

- Primary data
- Secondary data

Primary data - The primary data is collected by using primary method such as questionnaires. For this study questionnaires are used to collect primary data from the respondents.

Secondary data - Secondary data collected from various journals, websites and other research reports.

Sample size

Under this research 50 respondents in Chennai opinion are being to obtained on the basis of convenient sampling method.

Analysis and Interpretation:

Factors affecting work-life balance: The factor analysis results in five important work-life-balance factors of the respondents and the names were considered based on the list of items under each component and the respective loadings of the item. The Eigen value and the percent of variance explained by factors are presented in the below table

Table 1: Factors Constituting Work-Life-Balance

Sl.No	Factors	Number of Variables	Eigen Value	Percent of Variation Explained	Cumulative Percent of Valuation
1.	Job Nature	9	13.001	12.841	12.841
2.	Work Load	7	2.081	11.336	24.177
3.	Work environment	10	1.838	13.303	37.480
4.	Organizational support	6	1.428	10.864	48.343
5.	Family Domain	3	1.316	7.838	56.182

Source: Computed data

It is clear from Table 4 that five dominant work-life-balance factors, which consist of thirty five work life-balance components, accounted for 56.182 percent of total variance.

Inference: 'Job Nature' is the dominant factor that influences the work-life-balance since its Eigen value and percent of variation explained are 13.001 and 12.841 respectively. Work load is the next significant factor with Eigen value of 2.081 and percent of variation explained is 11.336. 'Work environment' is the third important factor followed by 'Organisation Support' and 'Family Domain' in terms of their Eigen value of 1.838, 1.428 and 1.316 and percent of variation explained with value of 13.303, 10.864 and 7.838 respectively. It is concluded

that 'Job Nature', 'Workload', 'Work Environment', 'Organizational Support' and 'Family Domain' are the predominant factors of work life balance.

Relationship and Impact of Work Life Balance on Employee's professional life: Correlation analysis was carried out to study the relationship between work life balance and professional life of working female employees. The results were shown in the below table.

Table 2: Professional Life

Work Life Balance	Pearson Correlation	.594
	Sig. (1 – tailed)	.000

Source: Computed data

Table 3: Showing Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	6.053	1.30	.594	5.231	.000
Worklife balance	.612	.085		6.943	.000

Dependent Variable: Professional Life

Source: Computed data

Value of t for human resource system comes out to be 6.943, p value is .000 and beta value is .594 which is significant at 5 percent level of significance. Thus null Hypothesis 2 was not accepted in this regard.

Inference: The result depicted significant positive relationship between work life balance and employees' professional life. Coefficient of correlation 0.594 is significant at 5 percent level of significance. The result depicted that there exists a significant positive relationship between work life balance and female employees' professional life.

Thus there is significant impact of work life balance on employees' professional lives. Hence there must be focus on improving the work life balance which will further improve their professional life leading to more productive and efficient staff.

Findings and Conclusion

Work-life-balance is an important issue in IT profession. In today's competitive era, with changing demands, regulations and so much pressure the work needs have increased a lot. This leads to increase in stress level of the female IT employees .Majority of the respondents expressed that there is no separate policy for work life balance in their organisation and many people were doing work overtime. Also management has not done much in terms of designing and implementing effective work life balance policies and practices. If the personal and professional lives of female employees are balanced, they can devote more time to their children and can focus on their upbringing. It was found that the number of hours worked per week, the amount and frequency of overtime, and inflexible work schedule increase the likelihood of employees to experience conflict between their work and family roles as it kills their time to perform family related activities.

Also there is significant positive relationship and impact of work life balance on employee's professional life. Study also revealed some of employees feel so stressed that they are not able to handle family responsibilities even after coming from workplace as they feel so tired and exhausted because of long working hours. Breaks are also very short so they were not able to take proper rest. However, their company provides no policy as such to help their employees meet their family commitment. Thus focus must be there in making policies that can help the female employees to have balance between the two.

The study was also able to measure women IT employees' work-life-balance and found that 'frequently extended work schedule', 'frequent changing requirement of clients', 'role overload', 'lack of flexible options' and 'unrealistic deadlines' are some important determinants which influenced women employees' work-life-balance. The analysis also reveals that five factors namely, Job Nature, Work Load, Job Environment, Organizational Support, and Family Domain constitute work-life-balance of women

professionals. The result of correlation analysis also confirms the positive correlation among the above five factors. The companies in IT industry may consider the above five factors and modify their HR policies suitably and create conducive work environment to maintain work–life-balance among women professionals so as to improve their performance.

Conflict of Interest: Nil

Ethical Clearance: Taken from UGC Committee

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Effectiveness of Sublingual Versus Oral Misoprostol for Induction of Labour at Term

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Abstract

Objective: To compare the efficacy and safety of 50 microgram (μg) sublingual Misoprostol with 50 microgram (μg) oral misoprostol for labour induction at term.

Method: One hundred twenty women with medical or obstetric indication for induction of labour at term with unfavorable cervix were randomized to receive 50mcg of misoprostol either orally or sublingually. Primary outcome was number of women delivering vaginally within 24hrs of induction. The need for oxytocin, mode of delivery, doses of Misoprostol required and neonatal outcomes were analyzed and compared between the groups.

Results: Induction to vaginal delivery time was <24hours in 43(71.7%) in sublingual group and 36(60%) women delivered vaginally in <24hours in oral group. No significant difference was found in the number of women delivering vaginally within 24hrs of induction among both the groups. Time from administration of first dose to delivery in sublingual group was lesser compared to oral group. 46.7% of women required oxytocin in sublingual groups, whereas 75% in oral group which was statistically significant. Sublingual group had lesser number of women requiring more than 1 dose of misoprostol compared to the oral group.

Conclusion: Sublingual misoprostol seems to be having better efficacy than the oral misoprostol and has lesser induction to delivery interval. Hence can be considered to induce labour at term for ripening of cervix.

Keywords: *Sublingual administration; oral administration; misoprostol; induction; labour.*

Introduction

"Induction of labor is defined as intervention designed artificially to initiate uterine contractions leading to progressive dilatation and effacement of the cervix and birth of the baby".(1) Induction is indicated when the mother and fetus are benefited with higher chance of healthy outcome than the birth being delayed.(1) Misoprostol is commonly used for induction of labor as it is stable at room temperature and has rapid onset of action. It can be administered in oral, sublingual or rectal routes. The efficacy of misoprostol varies with different routes of administration due to change in their pharmacokinetics. Sublingual route has better efficacy compared to other routes as it bypasses enterohepatic circulation and has lesser hyperstimulation rates.(2) The objectives of the study were to compare the efficacy of 50microgram of sublingual Misoprostol with 50microgram of oral misoprostol for labor induction at term, number of women delivering vaginally within 24 hours of the induction, induction to delivery interval and adverse effects and neonatal outcomes in two groups.

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Method

This hospital based non blinded randomized comparative study was conducted in the Department of Obstetrics and Gynecology department in a medical college in Karnataka over a period of one year six months between September 2014 and March 2016 after approval from the Institutional Ethical Committee of Kasturba Medical College, Manipal University, Mangalore. Informed and written consent was obtained from the women on a predesigned consent form.

Statistical Analysis: Sample size was taken as 120 women with term gestation with indications for labor induction 60 in each group.[3] Fisher's exact test and chi square test were applied for the statistical analysis. A statistical package SPSS version 17.0 is used to do statistical analysis. P value < 0.05 is considered to be significant.

Women were admitted in the hospital after satisfying the inclusion criteria. Demographic details such as age, height, weight, parity, gestational age and amniotic fluid index (AFI) and indication for induction were noted. They were randomized to receive either 50 mcg of sublingual (Group A) or 50 mcg of oral misoprostol (Group B) every 4th hourly till a maximum of three doses. A pelvic examination was done to assess the Bishop's score which was followed by a 20 minute Non stress test (NST) to rule out non-reactive fetal heart rate. Fetal and maternal monitoring was done by clinical auscultation of fetal heart rate and monitoring uterine contractions. Vaginal examination was done every 4 hours to assess Bishop's score. The dose was repeated every 4hours, a maximum of 3 doses were given. The dose was with-held in presence of active labor or contractions > 3 in 10 minutes or a Bishop's score of ≥ 8 or non-reassuring fetal heart status (NRFHS). Labor was managed according to labor room protocol for decisions regarding oxytocin augmentation and amniotomy. Failure to establish active labor even after three doses of misoprostol was considered as failure of induction.

Inclusion criteria were women in the age group between 18-35 years, live singleton pregnancy at term gestation (gestational age of > 37 weeks) with medical or obstetric indication for induction, cephalic presentation, unfavorable cervix (Bishop's score ≤ 6) and reassuring fetal heart tracing. Exclusion criteria were Cephalopelvic disproportion, history of caesarean section or any uterine surgery, multiple gestations, malpresentation, hypersensitivity reactions for prostaglandins, contra indications for prostaglandins usage (e.g. Asthma) and parity > 4.

The Primary outcome studied were number of women delivering vaginally within 24 hours. The Secondary outcomeanalyzed includetime interval between induction to vaginal delivery, number of misoprostol doses required, patients requiring oxytocin augmentation, failed inductions, number of caesarean section, neonatal outcomes-meconium stained amniotic fluid, non reassuring fetal heart status, Apgar score at 1 and 5 min and NICU admissions and side effects like uterine hyperstimulation, gastrointestinal disturbances and pyrexia.

Results

A total number of 120 women with term pregnancy were included and 60 women were assigned to receive a 50 mcg sublingual misoprostol and 60 women are assigned to receive a 50 mcg oral misoprostol.

Table 1 shows the indication of labor in both the study groups. Main indications for labor induction were postdatism and premature rupture of membranes. No significant difference were found between the two groups. Most of the participants were in the age group of 18-26 years i.e.45 (75%) and 37(61.2%) in Group A and Group B respectively. Most of the patients were nulliparous accounting to 80% in sublingual group and 70% in oral group. Induction to vaginal delivery time was <24hours in 43(71.7%) in sublingual group and 36(60%) women delivered vaginally in <24hours in oral group. No significant difference was found in the number of women delivering vaginally within 24hrs of induction among both the groups (Table 2). Time from administration of first dose to delivery in sublingual group was 11hrs 16min with standard deviation of 4hrs 15min, while in oral group the mean time from induction to delivery was 15hrs 15min with standard deviation of 6hrs 30min and was found to be statistically significant. These observations suggest that there was increased induction to delivery interval when misoprostol was used by oral route compared to sublingual route (Table 3).

In sublingual group, 45 (75%) required a single dose of Misoprostol for labor induction compared to 31 (51.7%) in oral group. In oral group, 29(48.3%) of the women required more than 1 dose of misoprostol compared to the sublingual group with p value of 0.029 which was statistically significant. In sublingual group, 53.3% of women did not need oxytocin for augmentation

of labor where as in Oral group, 75% of women required oxytocin (Table 4).

In sublingual groups, failed induction was observed in 8(13.3%), where as in oral group it was 9 (15%) and the result was not statistically significant. Number of women delivered vaginally was 44 (73.3%) in sublingual group and 40 (66.7%) in oral group. Cesarean delivery was 26.7% in sublingual group and 33.3% in oral group with a p value of 0.426 which was not statistically significant.

Most common indication for Cesarean delivery was failed induction in 8 (50%) in sublingual and 9 (45%) in oral group which was not statistically significant. Other indications were meconium stained amniotic fluid, non reassuring fetal heart status and secondary arrest of descent. Table 5 compared the neonatal outcome in both the groups. Meconium stained amniotic fluid, non reassuring feta heart status, low APGAR scores and NICU admissions were the neonatal outcomes and there were no statistical significance found among the two groups.

The most common side effects among both the groups were GI disturbances in 2(3.3%) sublingual and 6(10%) in oral group and pyrexia in 1(1.6%) sublingual and 3(5%) in oral group which was not statistically significant. There was no hyperstimulation noted in any of the cases in both the groups.

Table 1: Indications for induction and their distribution in both study groups

Indication for Induction	Sublingual Misoprostol N (%)	Oral Misoprostol N (%)	P value
Post datism	30(50)	36(60)	>0.05
Oligohydramnios	5(8.3)	2(3.3)	
Hypertension in Pregnancy	4(6.7)	3(5)	
PROM	21 (35)	19 (31.7)	
Total	60	60	

*p value<0.05 is considered significant

Table 2: No. of women delivered vaginally within 24hrs of induction

Induction to Vaginal Delivery Time	Sublingual N (%)	Oral N (%)
< 24 hours	43 (71.67)	36 (60)
> 24 hours	1 (1.6)	4 (6.6)
Total	44(73.3)	40(66.6)

Table 3: Time from induction to delivery

Induction to Delivery Time	Sublingual Group	Oral Group	P value
Mean	11 hour 16min	15hour 15min	0.001*(s)
Standard deviation	4hours 15 min	hours 30min	

*p value<0.05 is considered significant: s: significant

Table 4: No. of women required oxytocin augmentation

Oxytocin Augmentation	Sublingual N (%)	Oral N (%)	
Not required	32 (53.3)	15 (25)	0.001(s)
Required	28 (46.7)	45 (75)	
Total	60	60	

*p value<0.05 is considered significant: s: significant

Table 5: Neonatal outcomes among both the study groups

Neonatal Outcome	Sublingual N (%)	Oral N (%)	p value
MSAF	5 (8.3)	9 (15)	0.225 (NS)
NRFHS	3 (5)	4 (6.7)	0.697 (NS)
APGAR 1min <9	1 (1.7)	5 (8.3)	0.209 (NS)
APGAR 5min <9	1 (1.7)	1 (1.7)	1.000 (NS)
NICU admission	1 (1.7)	0 (1.7)	(NS)

*MSAF: Meconium stained amniotic fluid, NRFHS: Non reassuring fetal heart rate, *NS: Not significant

Discussion

The present study was a prospective study designed to study the effectiveness of the sublingual and oral misoprostol for term induction of labor. Post-datism and PROM were the most common indications for induction. Similar indications for induction of labor were noted in other studies.[3-5]

Forty three (71.6%) women delivered vaginally within 24 hours of induction with sublingual misoprostol compared to 36 (60%) women in oral group. According to the study conducted by Bartusevicius and colleagues, there was no statistical difference noted among women delivering vaginally within 24hours of induction with 50 mcg of sublingual misoprostol or 25 mg of vaginal misoprostol. 58 women (83%) in the sublingual group and 53(76%) in the vaginal group delivered vaginally within 24 hours.[4]

In the present study, time from administration of first dose to delivery in sublingual group was 11hrs 16min, in oral group the mean time from induction to delivery was 15hrs 15min and was found to be statistically significant. These results suggested that induction to delivery interval was increased when misoprostol was used by oral route compared to sublingual route. Similar results were observed in other studies.[4,5] Humaira Zaman Malik and colleagues compared 100 µg oral misoprostol with 50µg sublingual misoprostol for induction of labor, they observed that 92% women delivered within 12 hours of induction in sublingual group and 84% of women in oral group.[6] In sublingual group, 45 (75%) required a single dose of Misoprostol for labor induction compared to 31 (51.7%) in oral group. In oral group, 29(48.3%) of the women required more than 1 dose of misoprostol compared to the sublingual group. In sublingual group, 53.3% of women did not need oxytocin for augmentation of labor where as in Oral group, 75% of women required oxytocin. These results were comparable to other studies.[4–7]

In sublingual groups, failed induction was observed in 8(13.3%), where as in oral group it was 9 (15%) and the result was not statistically significant however in H.Z. Malik study, there were no cases of failed induction in both the groups.[6] Number of women delivered vaginally was 44 (73.3%) in sublingual group and 40 (66.7%) in oral group. Cesarean delivery was 26.7% in sublingual group and 33.3% in oral group with a p value of 0.426 which was not statistically significant whereas Bartusevicius and colleagues observed in their study, that there were no difference in the mode of delivery among both the groups. Seven(10%) in the sublingual group and 8(11%) in the vaginal group underwent emergency cesarean section for non reassuring fetal heart status.[4]In a study conducted at Mashhad University of Medical Sciences, where 25 µg vaginal misoprostol was compared with 25 µg sublingual misoprostol for induction of labor, women underwent cesarean section due to non establishment of active labour.[8]

The most common side effects among both the groups were GI disturbances in 2(3.3%) sublingual and 6(10%) in oral group and Pyrexia in 1(1.6%) sublingual and 3(5%) in oral group which was not statistically significant. There was no hyperstimulation noted in any of the cases in both the groups. In a study done by Sedigheh A and coworkers, Tachysystole, vomiting and abdominal pain were the common side effects in both the groups. Abdominal pain and vomiting were more in sublingual group than vaginal group.[9]

Meconium stained amniotic fluid, non reassuring feta heart status, low APGAR scores and NICU admissions were the neonatal outcomes and there were no statistical significance found among the two groups. Similar results were noted in other studies.[5,6,10,11] According to

Bartusevicius and colleagues, neonates were admitted in NICU for neonatal respiratory distress syndrome in the sublingual group and congenital infection and neonatal respiratory distress syndrome in the vaginal group.[4]

Conclusion

Sublingual misoprostol has better efficacy than the oral misoprostol and has shorter induction to delivery interval. It can be considered for ripening of cervix before induction of labor in high risk conditions and prolonged pregnancies.

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Study of Death among Children Below Five Years of Age and its Relation with Socio Economic Status and Place of Residence Using Verbal Autopsy as a Tool in Deharadun

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Abstract

In India about 2.1 million child deaths occur every year, which is the highest with in a single country worldwide. Mortality in under – fives is an indicator of diverse socioeconomic and cultural factors. This present study was conducted to find out relation in-between child mortality of under-five years of age and their socio economic status along with place of residence using verbal autopsy in Dehradun.

Methodology: The survey was done on all the house of the deceased children residing in our field practice areas by visiting their houses.

Results: Most of the deaths were found from lower socio-economic class among the 83 deaths reported during study period.

Conclusion: The study shows that as we moves up the socio economic class, the mortality rate tends to decline.

Keywords: *Verbal autopsy, socio-economic, deceased children, mortality, policy making, Millennium development goals.*

Introduction

The Millennium development goals (MDG) represent the widest commitment in history to addressing global poverty and ill health. The fourth goal (MDG-4) commits the international community to reducing mortality in children aged younger than five years by two – thirds between 1990 and 2015. Between 1960 and 1990 the risk of dying in the first five years of life was halved a major achievement in child health. However achieving (MDG - 4) will be depend on mortality reductions even greater in percentage terms than those achieved in the past[(1)]. Information on factors leading to death is extremely important for policy-making, planning, monitoring and evaluation of health programs, this is particularly more so important for childhood deaths, which is constituting a major portion of all deaths, and of which many intervention programs are currently attempting to reduce mortality among under five deaths[(2)].

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Material and Method

The study was undertaken for one year in the field practice areas of department of community medicine HIHT Dehradun after taking approval of institutional ethical committee. The total population registered under Rural Heath Training Centre (Rajeev Nagar) & Urban Health Training Centre was 12,588 and 12,930 respectively out of which under five children were 1297 at RHTC and 1325 at UHTC.

All deaths except still births registered with Rural and Urban Health Training Centre were included in the study. When a child died, the mother or the respondent was questioned in detail about the parents socio-economic status and place of residence of children prior to death. A drafted questionnaire (English version) developed by WHO, was modified suitably, as well as certain variables were added to find out any correlation in-between under five children death and parents socio-economic status along with place of residence[3]. The information so collected, was first coded and then entered in the computer. The analysis was done by using SPSS software. Appropriate statistical method (proportion and chi – square test) were applied as per requirement.

Result

Table 1: Distribution of deceased children by age, sex and place of residence (n=83)

	Rural (%)	Urban (%)	Total deaths (%)	Chi squar value	Degree of freedom	P value
Age of Deceased Children						
0-28 days	17 (43.6)	15(34.1)	32(38.6)	3.219	2	>0.05
29-<365 days	12(30.8)	10(22.7)	22(26.5)			
365 days-< 5Yrs	10(25.6)	19(43.2)	29(34.9)			
Sex of Deceased Children						
Male	18(46.2)	26(59.1)	44(53.0)	1.389	1	>0.05
Female	21(53.8)	18(40.9)	39(47.0)			

Table 2: Distribution of children by socio – economic status and place of residence

Scio–Economic Status	Place of Residence				Total	
	Rural		Urban			
	No.	%	No.	%	No.	%
Upper Middle	6	46.2	7	53.8	13	100.0
	0.5		0.5		0.5	
Lower Middle	112	35.7	202	64.3	314	100.0
	8.6		15.2		12.0	
Upper Lower	464	43.0	614	57.0	1078	100.0
	35.8		46.3		41.1	
Lower	715	58.8	502	41.2	1217	100.0
	55.1		37.9		46.4	
Total	1297	49.5	1325	50.5	2622	100.0
	100.0		100.0		100.0	

[$X^2 = 5.868$, df=4, p>0.05; NS]

Discussion

Present study shows that in rural area 55.1% belonged to lower socio – economic class which was followed by 35.8% in upper lower, and 8.6% were in lower middle class. In the urban area 46.3% children were from the upper lower class, 37.9% were in lower class and 15.4% in the lower middle class. There were no children in upper socio-economic class in both the area while only 0.5% children in both the area belonged to upper middle class. This could be due to the fact that urban slums were selected for the study purpose, and they consisted mainly of the migratory population. The socio-economic status of both the study area is same and comparable however association between socioeconomic status and place of residence was found to be statistically insignificant.

In the present study maximum mortality in both urban (71.8%) and rural area (78.3%) were in children belonging to lower and upper lower class. No mortality

was seen in children belonging to upper class. This could be that being coming from lower and upper lower socio-economic class they were not well off financially and could not afford medical expenses. The findings suggest that as we move up the socio-economic class, the mortality rate tends to decline. Similar observations were observed by Hosseinpoor et al (2005) [4] that the infant mortality was concentrated among people of low socio-economic status. Similarly,Sharma and Gupta (2005)[5]also observed in their cross-sectional study on the prevalence of at risk under – five children in rural area, that at-risk children were significantly from the low socio-economic group. Calazzo et al (2004)[6]also states that socio economic inequality and its impact on health is a growing concern in the European public health debate.

Amouzou and Hill (2002)[7] found that at risk children were significantly from the low socio-economic group. They found a clear association of high mortality with low income. In another study done by Reddiah and Kapoor (1992) [8]showed in their study on socio biological factors in under – five deaths analyzed 281 under – five deaths and found that deaths in socially and economically disadvantage cases constituted 77.6%.

According to NFHS–3 Uttarakhand (2006)[9] Children living in the highest wealth quintile households are much less likely to die before their first birthday as children living in other wealth quintile households. Another study done by Cornelius Nattey (2013)[10] that household socio-economic inequality and maternal education were observed to be strongly associated with under-five mortality in rural Tanzania.

The UN Inter-agency Group for Child Mortality Estimation (UN IGME) reported that, out of 99 surveyed LMICs, children born to the poorest families were on average, twice as likely to die before the age of five compared with children born to the wealthiest families (UN IGME 2017)[11].A systematic review and meta-analysis done by Bernadette O'Hare(2013)[12]on income and child mortality in developing countries also came to this conclusion that there is an inverse and significant relationship between income and child mortality.

McKinnon B(2014)[13] published his work in Lancet Global Health,that a substantial survival advantage remains for babies born into wealthier households with a high educational level, which should be considered in global efforts to further reduce NMR. Khadka KB(2008)[14] also stated that socioeconomic distal and proximate determinants are associated with infant mortality in Nepal. Infant mortality was higher in the poor and middle classes than the wealthier classes. Park (2005)[15] In industrial world a dominant factor in the decline in infant mortality has been social and economic progress. Study done by Victora CG (2003)[16] also shows that poor infants are more likely to be exposed to health risks than their better-off peers, and they have less resistance to disease because of under-nutrition and other hazards typical in poor communities.

Conclusion

Our study as well as studies from different parts of globe establishes an inverse and significant relationship between income and child mortality, so while making policies to bring down under five mortality specially in developing and under developed countries, socioeconomic conditions of people must be kept in consideration.

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References in Vancouver style

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Impact of Body Mass Index and Age on Mental Health of Adolescents Girls

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Abstract

Adolescent girls in India may face poor nutritional status due to low access to healthy food and high mental health symptoms attributed to high stress. Total 72% of infants and 52% of married women have anaemia. Researches indicated that malnutrition during pregnancy causes the child to have increased risk of physical retardation and reduce cognitive abilities. The objective of the present study was to investigate the impact of body mass index and age on mental health of adolescent girls. 1000 adolescent girls were selected through stratified random sampling technique from different government school of Raipur, India. Mental health was measured by Mental Health Battery. Anthropometric measurement and age was collected by the standard procedure. Multivariate analysis of variance and post Hoch test were employed to analyze the data. Results revealed that adolescent girls significantly differ in emotional stability, overall adjustment, autonomy, security-insecurity, intelligence and over all mental health with increasing age. Post Hoch test showed that adolescent girls with low body mass index differ significantly on overall adjustment and self concept dimension of mental health in comparison to adolescent girls with normal BMI. It is concluded from the study that adolescent girls of early years (12-14) must be given environment to develop Emotional Stability, Autonomy, Security-Insecurity and Intelligence. Proper nutrition is needed to improve self concept and over all adjustment. Findings of the study draws attention to create awareness related to mental health and nutrition.

Keyword: *Mental health, BMI, Adolescent Girls.*

Introduction

Adolescence is transitional stage of human life cycle with different kind of physiological change. This period is very crucial since these are the formative years in the life of an individual when major physical, psychological and behavioural changes take place [1,2]. Every stage of human growth and development is affected by mental health. The mind and the body are connected[3]; hence affect each other patterns of activity, poor diet, poor sleep habits etc are factors which determine health[4]. Diet can have both significant positive and negative impacts on physical and mental health. Positive associations were observed between mental health problems and menstrual cycle irregularity among adolescent girls[5].

The nutritional status of an individual is influenced by a variety of factors, including: Life stage, environment, food access, and socioeconomic status[6]. In turn, each of these factors can influence mental health[7]. Mental health problems are the highest prevalence of any age group[8].

Malnutrition occurs when there is an imbalance of energy and protein in an individual's diet or body may become unable to absorb the nutrients[9]. Nutritional deficiencies lead various health problems which are found everywhere, and most often go without cures/ treatment. Deficiency of both macro- and micronutrients

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has been associated with increased behavioural problems[10]. There is a strong relationship between nutrition and mental health in adults[11,12,13]. Malnutrition is also associated with mental health, particularly depression among elderly individuals[14]. Studies have found depressive symptoms to predict malnutrition in community living elderly[15], Further more, studies of the relationship body mass index (BMI) and age with mental health in adolescent's girls' individuals have yielded conflicting results. However, no studies have yet identified the impact of body mass index and age on mental health in Indian adolescent's girl's population of government school setting.

Therefore, the aim of this study was to determine the status of mental health in a government school-attending adolescents girls population and examine the impact of BMI and age on mental health & its dimensions (Emotional Stability, Over-all adjustment, Autonomy, Security-Insecurity and Intelligence).

Method

Sample: Seven independent samples of students from 12, 13, 14, 15, 16, 17, and 18 year age groups were selected (see figure-1). In this study stratified random sampling technique was used; 8 State government schools were selected based on the principle of randomness.

Exclusion Criteria: Who are not interested to participate, not able to understand Chhattisgarhi and Hindi, participants with an associated somatic and psychiatric problem (CVA, cancer, dementia other several medical problems) were excluded.

Research Design: A cross-sectional design was used.

Tools: Mental Health status was measured by Mental Health Battery [16]. It consisted 48 items with six dimensions, of Mental Health viz. emotional stability, over-all adjustment, autonomy, security-insecurity, self-concept and intelligence. The test-retest reliability was found to be 0.74. The concurrent validity was found to be 0.77.[16]. Anthropometric measurement (height and weight) was collected following the standard procedure as described bygivson[17]. And Body Mass Index (BMI) was calculated by WHO and categorized[18],[19]. Age was obtained by the demographic checklist.

Procedure: First of all the authorities of different schools and parents of students were requested to give permission for collecting data from the students. After getting permission the female students they were contacted in group in their respective schools. Participants were assured that their involvement was voluntary and anonymous and that they maintained the right to withdraw their participation at any time. Written consent in printed proforma was obtained from the individual participants and their parents of the sample included in the study. The investigator explained about purpose of the research to the authorities of schools, participants and there parents. Than after the instructions given on the questionnaire were explained to them. At the completion of the inventory, participants were thanked for their contribution.

Statistical Analysis: Descriptive statistics, MANOVA and Post Hoch test were analyzed with the help of SPSS 16.0 version.

Results

The results are obtained in terms of frequency with respect to age variables are presented figure 1.

Figure 1: Indicates total number of participants in different age group.

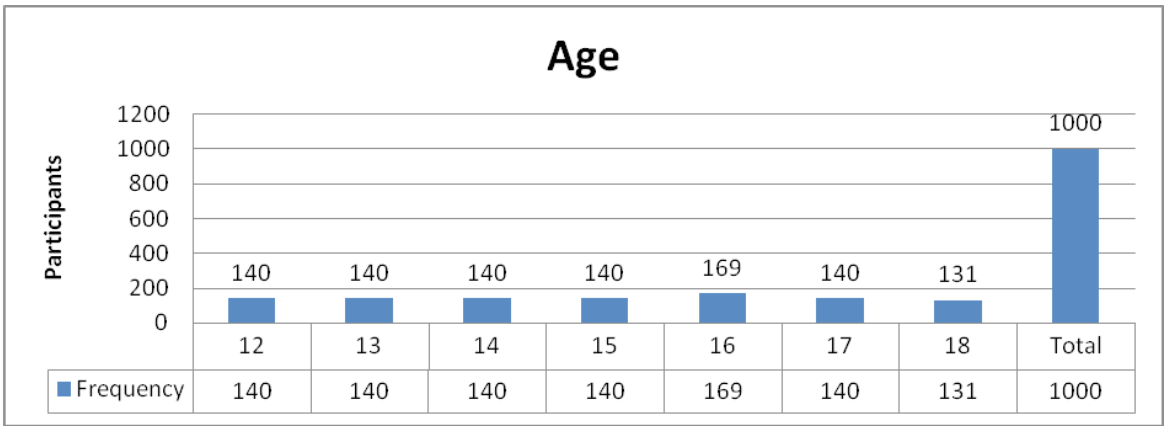

Table 1. Results of the appropriateness of MANOVA of mental health with respect to different age and BMI groups of adolescents' girls.

	Name of test	Value	F	Hypothesis df	Error df	Sig
Age Group	Roy's Largest Root	.048	7.691	6.000	971.0	.000
BMI Category		.013	2.148	6.000	968.0	.046
Group * BMI Category		.040	2.168	18.000	971.00	.003

Among the test of appropriateness of MANOVA (Pillai's trace, Wilks' Lambda, Hotelling's Trace and Roy's Largest Root) Roy's Largest Root was considerd appropriate to find out the difference in mental health and its various dimensions with respect to age and BMI. As shown in table 2 the F ratio is significant for age group, BMI as main effect and interaction effect between age group and BMI. It gives appropriateness for computing MANOVA.

Table 2. Univariate effects of age, BMI and their interaction in mental health and its various dimensions

Source	Dependent Variable	Sum of Squares	df	Mean Square	F	Sig.
Age group	ES	113.038	6	18.840	3.554	.002
	OA	110.131	6	18.355	1.628	.136
	AY	84.474	6	14.079	3.786	.001
	SI	59.476	6	9.913	2.214	.040
	SC	31.365	6	5.228	1.464	.187
	IG	172.369	6	28.728	3.486	.002
	Total	1088.074	6	181.346	5.302	.000
BMI Category	ES	15.980	3	5.327	1.005	.390
	OA	53.436	3	17.812	1.580	.193
	AY	7.486	3	2.495	.671	.570
	SI	8.899	3	2.966	.663	.575
	SC	18.136	3	6.045	1.693	.167
	IG	14.406	3	4.802	.583	.626
	Total	19.840	3	6.613	.193	.901
Age Group and BMI Category	ES	88.138	18	4.897	.924	.549
	OA	301.242	18	16.736	1.485	.087
	AY	89.955	18	4.998	1.344	.152
	SI	69.743	18	3.875	.865	.622
	SC	79.704	18	4.428	1.240	.221
	IG	133.566	18	7.420	.900	.578
	Total	904.458	18	50.248	1.469	.093

Table 2, indicates significant difference between various age groups in *Emotional Stability* (F=4.491, P=0.0001), *Autonomy* (F=7.016, P=0.000) *Security-Insecurity* (F=3.336, P=0.003) and *Intelligence* (F=4.043, P=0.001).

Table 3. Results of Post ANOVA comparison of mental health & its dimensions indifferent age groups of adolescents' girls.

Tukey HSD					
Dependent Variable	**(I) Year**	**(J) Year**	**Mean Difference (I-J)**	**Std. Error**	**Sig.**
ES	14	15	1.0466*	.27965	.003
	16	18	-.8760*	.26780	.019
	18	15	1.3454*	.27965	.000
OA	12	14	-1.5885*	.40202	.002
AY	12	18	-.8363*	.23407	.007
	13	17	-.7429*	.23015	.022
		18	-1.2792*	.23407	.000
	14	18	-.9893*	.23447	.001
	15	17	-.7357*	.23015	.024
		18	-1.2720*	.23407	.000
	16	18	-1.0383*	.22415	.000
SI	12	18	-1.0034*	.25761	.002
IG	12	15	-1.2286*	.34323	.007
	15	18	1.3440*	.34907	.002
Total	12	14	-3.3983*	.70027	.000
		16	-2.3754*	.66836	.007
		17	-2.1286*	.69902	.038
		18	-4.0632*	.71092	.000

Tukey's post hoc test showed pair wise comparisons, significant difference (P<0.05) existed in total Mental Health between 12 and 14, 12 and 16, 12 and 17, and 12 and 18 years age groups. In cases of ES, OA, AY and SI dimensions of mental health, significant difference (P<0.05) between 14 and 15, 16 and 18, 18 and 15 for ES the difference were observed between 12 and 14 for OA, differences were observed 12 and 18, 13 and 17, 18, 14 and 18, 15 and 17, 18, 16 and 18 in case of AY, difference between 12 and 18 was observed for SI difference was noted between 12 and significant differences between 15, 15 and 18 were also recorded for IG.

Table 4. Results of Post ANOVA comparison BMI group difference on mental health dimension.

Tukey HSD					
Dependent Variable	**(I) BMICategory**	**(J) BMICategory**	**Mean Difference (I-J)**	**Std. Error**	**Sig.**
OA	Normal	Severe Malnutrition	.8808*	.33972	.048
	Severe Malnutrition	Normal	-.8808*	.33972	.048
SC	Normal	Severe Malnutrition	.5816*	.19120	.013
	Severe Malnutrition	Normal	-.5816*	.19120	.013

Table 4 revealed that the adolescent girls with normal nutrition and severe malnutrition differ significantly on OA and SC dimensions of mental health.

Discussion

Results indicates increasing trend with age in over all mental health and it's dimensions (ES, AY, SI and IG)

of adolescent girls. It indicates that girls develop stable feeling, self determination in thinking, sense of safety and general ability in behaving purpose fully in ones environment as they age. Over all mental health refers to manifesting self evaluation and adjustability which increases with increase in age. Various laboratory and survey measures show that spontaneous use of cognitive regulatory strategies increases during childhood and adolescence[20-21]. The findings convey early of girls, are of low on over all mental health with low level of ES, OA, AY, SI & IG in comparison to other age groups. It is because of the physical physiological & social change in development taking place. Eating patterns and mental health problems in young adolescents is significantly associated. A diverse diet rich in unrefined plant foods, fish and regular meals was associated with better mental health, while energy-dense, nutrient-poor diets and irregular meals were associated with poorer mental health[22]. Previous work has found that females who have suffered from mental health problems consume greater quantities of unhealthy foods [11,12,13]. Results indicate significant difference in emotional stability of girls of age group 14 & 15 yrs, 16 & 18 yrs & 18 & 15 yrs. 14 year age group girls seem to be more stable in comparison to 15 & 16 year old girls. It may be because the physiological turmoil puberty age ceases at 14yrs. ES during 15 & 16 is low which may be due to the heterosexual attraction and social approval becomes prominent concern for girls in these age groups, mean values indicate that the late adolescent groups are significantly stable in ones feeling, in comparison to early and middle adolescent age groups.

Early and middle age group adolescents girls differ significantly from girls of late adolescent age groups on autonomy dimensions and also significant deference between 12 and 14 on over all adjustment. Girls of middle adolescent level exhibit more in harmony with environment and their cognition in comparison to early adolescent girls. Increase in age the girls are able to govern and control their own affairs and gain higher level of self determination. The ability to make choices and exert control on life plays an important role in psychological health and well being, On SI dimension adolescent girls of, 12 year differ significantly from 18 years. In late adolescent stage the girls are physically and psychologically matured feel more sense of safety than early adolescent group of girls. On over all mental health, early adolescent girls showed significantly lower values as compared to middle and late adolescent groups, which indicated that as age increases self evaluation and adjustability also increases, leading to maturity.

The adolescent girls with severe malnutrition showed poor over all adjustment and self-concept. Malnutrition leads to disharmony in cognition and environment they are unable to understand and perceive the conditions in right way, leading to poor adjustment. The adolescent who suffer from malnutrition also have low self concept, that is attitude toward self and evaluation of their achievement is negative. The impact of BMI reveals the importance of nutrition in growth and psychological health.

Early adolescents group show low ES, OA, AY, SI, IG and overall mental health which can be attributed to physiological changes and social development during adolescent period. In later adolescent period parent and social control loosens and the adolescents conflict level decreases resulting into improved mental health and adjustment.

The results are in contradiction with the findings of earlier researches which state mental health of early adolescent group is better than later adolescent group [23]. As the present finding indicate that the middle & late adolescent group is mentally health and emotionally stable well adjusted & more secure. The finding of the study is also coherence with the findings who reported extremely low BMI was related with mental problems[24,25,26].

Conclusion

It is concluded from the study that adolescent girls of early years (12-14) must be given environment to develop Emotional Stability, Autonomy, Security-Insecurity and Intelligence. Proper nutrition is needed to improve self concept and over all adjustment. Mental health was strongly affected by the malnutrition in school going adolescent girls and this impact was also significant for subthreshold mental health symptoms. Findings of the study draws attention to create awareness related to mental health and nutrition.

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Early Childhood Caries and its Prevalence among the Preschool Children's Attending the Anganwadi's at Ukkali Vijayapura District, Karnataka India

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Abstract

Introduction: Early Childhood Caries (ECC) is a preventable chronic disease which is mainly affecting infants and children worldwide. The early identification and detection of ECC can reduce pain, life threatening conditions and helps in the growth and the overall development of the child.

Aim: To find out the prevalence of Early childhood caries (ECC) among the children attending the Anganwadi's of Ukkali Vijayapur district, and its relationship with parent's education, occupation, socio economic status of the family with feeding habits and early oral hygiene mentions.

Materials and Method: Community based cross sectional study among the selected Anganwadi's children of 1-5 years of age at Ukkali district Vijayapura.

Result: A total 142 subjects, 34 children were found to be having ECC, 57(40.1%) males and 85 (59.9%) females. A significant association was found in these study with the age of the children, breast feeding duration and the oral hygiene proposes, out of 142 cases 34 cases were having ECC therefore the prevalence of ECC was 23.9%.

Conclusion: Future health promotion and education programs in Anganwadi's should include oral health issues and the risk factors for ECC, and its consequences should be addressed.

Keyword: *Children, Early childhood caries, Prevalence, Primary teeth.*

Introduction

Dental caries is one of the most common chronic diseases of early childhood Dental caries in primary dentition is often neglected since they exfoliate, and its treatment is considered as economic burden among lower socioeconomic families. [1]. Early childhood caries (ECC) is a chronic, disease with its complex and multifactorial etiology [2]. ECC is commonly seen in any tooth surface of primary teeth between the age group of children 1 to 5 years [3]. Dental problems in early childhood age have shown to be predictive of future dental problems, with the growth and development of child also interfering with nutrition, concentration, and school participation[4].

India, Is a developing country and the incidence of dental caries is increasing due to the changing

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lifestyle and dietary patterns.[5] The Government of India initiated a National Scheme known as the Integrated Child Development Services (ICDS) which aims at the delivery of a package of basic health services through various functionaries. Anganwadi worker (AWW) is the most periphery functionary of the ICDS scheme. She delivers services to mainly children below the age of 6 years, including mainly nonformal, preschool education, health, and nutrition maintenance. Most of the preschool children belonging to low socioeconomic status attend Anganwadi schools [6]. The prevalence of ECC in the developing countries is reported to be as high as 70%[7]. Some of the published studies showed an ECC prevalence of 19-54% in the Indian population[8]. An early identification of dental caries provides an opportunity to identify the children who are at a greater risk for the disease so that appropriate preventive interventions can be initiated to protect the unaffected teeth and protect the permanent dentition[10]. To the best of our knowledge, no other studies have been conducted to assess the prevalence of dental caries among Anganwadi children in Ukkali village of Bijapur district. The present study is an effort to determine the prevalence rate and evaluate its associated risk factors of ECC among the Anganwadi's children within 5 years of rural health centre Ukkali.

Method

The study group consisted of 142 preschool children of 1 to 5 years of age group from various Anganwadi centers, rural health Ukkali. Institutional Ethical Committee Clearance (IEC) was obtained, and the consent for examining the children was procured to the Anganwadi's worker and the parents of the children. Clinical examination was done using a sterile mouth mirror, and probe. The decayed teeth were recorded and patients who required treatment for the decayed tooth cards were issued for the treatment and instructions are given to the children to accompany with their parent for the dental treatment.

Total children in eleven anganwadi centre of rural health Ukkali were about 1264. Male 668 and female were 596. All the children of preschool who were accompanied with their parents and present on the day of examination are included in the study. Children suffering from systemic disease and absent on the day of examination were excluded from the study.

Results

Out of the 142 subjects examined, 40.1% (57) were males and 59.9% (85) were females. On the whole 23.9% (34) had ECC while 76.1% (108) children had no caries.

Birth orders of total 142 children were distributed in five groups. The total 36 children in 1st order having ECC were, 10 (27.8%), 53 children in the 2nd order having ECC were, 13(24.55%), 37 children in the 3rd order having ECC were 5(13.5%), 13 children in the 4th order having ECC were 6(46.2%) and children with 5th order were total are 3 none of them were effected with ECC. No difference was found between the birth order of the child and ECC. Mothers of total 97 children were illiterate, children effected with ECC were 25(25.8%), mother with primary education total are 31, children effected with ECC were 6(19.4%), mother with secondary education total are 11, 2(18.2%) were effected with ECC, and 3 of them are higher education with ECC are 1(33.3%). No difference was found between mother's educations. No difference was found between the social class of the family and ECC.

Table 1: Association of ECC and Demographic variables of the Subjects

Variables		ECC Absent		ECC Present		p value
		N	Percent	N	Percent	
Age (Yrs)	1-2	45	100.0	0	0.0	0.000*
	3-4	52	65.0	28	35.0	
	>4	11	64.7	6	35.3	
Gender	Male	42	73.7	15	26.3	0.588
	Female	66	77.6	19	22.4	

Variables		ECC Absent		ECC Present		p value
		N	Percent	N	Percent	
Birth Order	1	26	72.2	10	27.8	0.137
	2	40	75.5	13	24.5	
	3	32	86.5	5	13.5	
	4	7	53.8	6	46.2	
	5	3	100.0	0	0.0	
Mothers Education	Illiterate	72	74.2	25	25.8	0.830
	Primary	25	80.6	6	19.4	
	Secondary	9	81.8	2	18.2	
	Higher	2	66.7	1	33.3	
Social Class	I	2	66.7	1	33.3	0.495
	II	55	72.4	21	27.6	
	III	47	79.7	12	20.3	
	IV	4	100.0	0	0.0	

*significant with p<0.05

Table 2 shows that all study subjects were having the history of breast feeding. Around 9 children were breastfed for less than 6 months. No children were having ECC. Out of 105 children were breastfed for one year, 31(29.5%) showed ECC present. 28 children are breastfed more than a one year around 3(10.7%), were having ECC positive. A significant association was found between the history of breast feeding and ECC. P- 0.026.

Table 2: Association of ECC and Breast feeding variables of the Subjects

Variables		ECC Absent		ECC Present		p value
		N	Percent	N	Percent	
Breast feeding (months)	<6	9	100.0	0	0.0	0.026*
	6-12	74	70.5	31	29.5	
	>12	25	89.3	3	10.7	
Bottle feeding	No	96	77.4	28	22.6	0.318
	Yes	12	66.7	6	33.3	
Duration of Bottle feeding (months)	6-12	4	57.1	3	42.9	0.397
	12-18	5	62.5	3	37.5	
	>24	3	100.0	0	0.0	
Frequency/day of Bottle feeding	Twice	5	71.4	2	28.6	0.732
	Thrice	7	63.6	4	36.4	
Sugar in Bottle feeding	Yes	3	100.0	0	0.0	0.18
	No	9	60.0	6	40.0	
Bottle feeding at night	No	7	70.0	3	30.0	0.737
	Yes	5	62.5	3	37.5	
Frequency of Meals/day	No Meals	10	100.0	0	0.0	0.278
	Once	8	66.7	4	33.3	
	Twice	56	75.7	18	24.3	
	Thrice	34	73.9	12	26.1	

*significant with p<0.05

Bottle Feeding: Total 18 children gives a history of bottle feeding with 6(33.3%) shows ECC present. No significant difference with history of bottle feeding and frequency of bottle feeding with ECC. No significant difference seen with the content of bottle feeding, bottle feeding at night and frequency of meals per day with ECC.

Table 3 showed that 42 children not started cleaning only 4 of these children showed ECC present. About 35 children started cleaning from 4 months and 8 of these children showed ECC positive. Around 44 children started cleaning.

Method of Cleaning: 54 children used to clean their teeth with brush and paste, out of these 16 (29%) were having ECC. 31 children used to clean their teeth with finger and paste, out of these 9(29.0%) were having ECC. 15 children used to clean their teeth with finger and powder (Lal Manjan, salt with coal powder) out of these 5(33.3%) were having ECC. 42 children not is to clean their teeth, around 4(9.5%) of these showed ECC present. No significant p value seen between method of cleaning and ECC.

Table 3: Association of ECC and Teeth cleaning variables of the Subjects

Variables		ECC Absent		ECC Present		p value
		N	Percent	N	Percent	
Cleaning Started Months/years	Not Started	38	90.5	4	9.5	0.005*
	1-4 months	27	77.1	8	22.9	
	5-6 months	28	63.6	16	36.4	
	9 -10 months	15	78.9	4	21.1	
	1-2 yrs	0	0.0	2	100.0	
Method of Cleaning	Brush/paste	38	70.9	16	29.1	0.074
	Finger/paste	22	71.0	9	29.0	
	Finger/powder	10	66.7	5	33.3	
	Do not Clean	38	90.5	4	9.5	

*significant with $p<0.05$

Discussion

The present study was undertaken to assess the existing knowledge of early childhood oral health related factors among eleven Anganwadi centre of rural health Ukkali, so that effective pediatric oral health measures can be provided, there by safe guarding the growth and development of young children.

A total of 142 children of less than 5 years of age groups are selected and screened to determine the prevalence of ECC from the 11 Anganwadi's at Ukkali. The prevalence of ECC in the present study was, out of 142 cases 34 cases were having ECC therefore the prevalence of ECC is 23.9%.

The mean dmft found in Karnataka (Bangalore), Andhra Pradesh and Kerala were 0.6, 1.63, and 2.1 respectively[11]. Another study was conducted to compare the prevalence and pattern of caries in 4-5½-year-old children of urban Bangalore and non-urban Chikkaballapur within Karnataka state, India. The results showed caries prevalence of 66.3% with a mean deft of 2.9 in Bangalore city whereas in Chikkaballapur, the prevalence was 58.4%[12.] The prevalence of ECC in urban Bangalore within Karnataka state was 27.5%[10]. In the present study ECC prevalence is low compared to all above studies.

In this present study no significant association was found between the age of the children and ECC, this finding does not coincide with finding of Wendt L K in Sweden showed that the prevalence increases with high age group[13].

The present study the prevalence of ECC was found to be more among girls (22.4%) compared to

boys (26.3%). ECC among male and female shows no significant association. The present study doesn't coincide with study done Olmez S[14].

Children with birth order 1 and 2 showed higher prevalence of ECC than children with subsequent birth orders. However no significant association was found in the birth order and ECC.

No significant association was found between the social class and mother's education with ECC. Some study showed that higher ECC prevalence found with the lower family income[15].

Significant prevalence of ECC with breast feeding is seen in the present study. Correlates with study done Roberts GJ[16], showed that prolonged and excessive breast feeding also has been suspected as a causative factor in ECC.

In present study bottle feeding duration, frequency, with or without sugar and frequency of meals shows no significant correlation with ECC. Some study showed that increased frequency of bottle feeding increases the prevalence of ECC[17, 18].

Maximum of children in the present study started cleaning their teeth after the age group of 3 years. The children in the age group of 3, 4, 5 years showed a significant prevalence of ECC with cleaning of the teeth. As in accordance with other studies, caries prevalence was seen to increase significantly with age. As children grow older, change in their dietary habits and oral hygiene practices pose a greater cariogenic challenge[19, 20]. The method of cleaning teeth did not show any significant relation with ECC. Tooth brushing, early onset of tooth brushing, parental supervision of tooth brushing and daily use of fluoride dentifrices were shown to significantly reduce prevalence of ECC [21, 22].

Conclusion

Dental health services should be made available in the peripheral areas to meet the needs of young children. Future health promotion and education programs in Anganwadi's should include oral health issues and the risk factors for ECC, and its consequences should be addressed. Public funded oral health program should be started and targeted at children from lower socioeconomic status

Ethical Clearance Oral consent from parents and children has been taken

Source of Funding- Self

Conflict of Interest - Nil

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Knowledge, Attitude and Practices of Biomedical Waste Management among Dental Practioners in Karad City, Maharashtra, India

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Abstract

Introduction: Biomedical waste is generated routinely in high amounts in the dental office, the correct disposal of which bears importance to the dentist, staff and healthcare workers. This is the first of its kind study in the city of Karad which will provide an important insight into the proper method and knowledge of disposal of health care waste by the dental practitioners. The application of this study will be in accessing the legal necessity and social responsibility of the healthcare personnel's in the effective management of biomedical waste.

Materials and Method: The study population included 100 private practitioners in Karad City, Maharashtra. A self-administered questionnaire was distributed to assess the knowledge, attitude and practices regarding dental waste management. Descriptive statistics was used to summarize the results.

Results: Out of 100 study participants, 73 (73%) were males and 27 (27%) were females. The maximum number of participants belonged to the age group of 34-38 years (29%). Undergraduate qualification was more (80%) and 43% participants had an experience of 0-5 years. Chi-square analysis showed a highly significant association between participant who attended continuing dental education (CDE) program and their practice of dental waste management.

Conclusion: Lack of knowledge and professional training in disposal of biomedical waste becomes a direct threat to the humans as well as the environment. CDE programs would help bring about a change in the management of healthcare waste.

Keywords: *Biomedical waste, dentist, hospital waste.*

Introduction

The health care sector produces a huge amount of biomedical waste in the course of curing health problems. The management of hospital waste or biomedical waste is considered as an important aspect to avoid various hazards to the humans and environment. Since this waste keeps generating continuously, it is the legal necessity and social responsibility of every healthcare professional to meticulously segregate and dispose the waste.[1] Biomedical waste means any waste, which is generated during the diagnosis, treatment and immunization of human beings or in research activities pertaining thereto or in the production or testing of biological, and including categories mentioned in Schedule 1 of the Government of India's Biomedical Waste (Management and Handling) Rules 1998.[2]

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On an average per day per bed, 0.5-2 kg waste is generated in India. Annually 0.33 million tons of hospital waste is generated in India. Biomedical waste not only poses great threat to the environment and the general population, but also to the ones who handle it and carry out the disposal.[3] 15% of the total waste generated is infectious and hazardous. This waste pertains to be a threat to the living as well as the non living thing.[4]

This waste plays a significant role in the spread of pathogens like HIV, Hepatitis B & C. Dental offices generate a large amount of biomedical waste daily. This waste is of equal harm to the environment and atmosphere as to the humans.[5] Lack of knowledge persists regardless of the professional training and thus, necessary measures to deliver awareness is the need of the hour.[6,7] Hence this study has been undertaken to assess the knowledge of dental practitioners in Karad city, understand the practices of waste disposal, train the healthcare workers and to take measures in establishing a protocol.

Materials and Method

A cross-sectional study was conducted among the dental practitioners in Karad city, Maharashtra, India from December 2018 to February 2019.

A pre-tested, self-administered, closed-ended questionnaire was designed for recording all the relevant data pertaining to general information of the study participants and knowledge and practices regarding dental waste management in a private clinic. Ethical approval was obtained from the Institutional Ethics Committee of KIMS Deemed to be University, Karad. Questionnaires were adopted from previous studies and modified.[1,8] A few new questions were formulated, some questions were modified while some were considered unnecessary and removed since this did not hamper with the fluidity of the questions.

The questionnaire consisted of 18 questions to assess the knowledge and the practice of biomedical waste management. The questions were grouped under Knowledge/Cognizance, Attitude and Practices/ Execution of biomedical waste and its management.

Questions to access knowledge were of a multiple choice type, only one response being the correct one. Questions to access attitude were presented in positive or negative response format (Yes/No/Don't Know). Questions regarding practice were of multiple choice type, including the various method which may be implemented in routine practice. Each correct and incorrect response in the knowledge section and each yes and no or don't know for the attitude and practice question are to be given 1 and 0 mark, respectively.

The study sample was collected. The study population comprised of 112 private dental practitioners, of which 100 dental Practioners gave consent to participate in the study. The study participans were given sufficient time to answer the questionnaire and the questionnaire was collected back on the same day or the next day. Questions about KAP were assessed for scores individually. Descriptive summary using frequencies, proportions and cross tabs were used to present study results. The collected data was entered in Microsoft excel sheet and subjected to statistical analysis. Statistical significance was analyzed using Chi-square test. The level of significance was set at 5%. The Statistical Package for Social Sciences (SPSS) version 21.0 was used for the statistical analysis.

Results

A total of 100 participants were recruited for this study, with a 100% response rate. As shown in Table 1, 73(73%) participants were males and 27 (27%) were females. The maximum number of respondents belonged to the age group of 34-38 years (35%). Respondents with undergraduate qualification were more (80%) compared to postgraduate qualification (20%). 43 (43%) participants had an experience of 0-5 years.

Graph 1 shows that 47 participants have attended CDE programs on dental waste management, Graphs 2 and 3 show that the distribution of respondents by correct knowledge and practice answers.

Table 2 shows the association between CDE program an knowledge scores of dental waste management. Knowledge score was good among 31.91% subjects who attended CDE programs.

Table 3, it is evident that good waste management practice was observed in those who attended CDE programs 36.17% compared to those who did not attend CDE programs. Association between CDE program and practice scores of dental waste management was statistically significant (<0.05).

Table 1: Demographic distribution of Practicing Dentists in Karad according to age gender, qualification and experience

Sociodemographic Variables	n (%)
Age in Years	
23-28	8(8)
29-33	24(24)
34-38	35(35)
39-43	19(19)
44-48	5(5)
49-53	4(4)
54 & Above	5(5)
Gender	
Male	73(73)
Female	27(27)
Qualification	
BDS	80(80)
MDS	20(20)
Experience (in Years)	
0-5	43(43)
6-10	35(35)
>10	22(22)

Table 2: Association between CDE program and knowledge scores of dental waste management

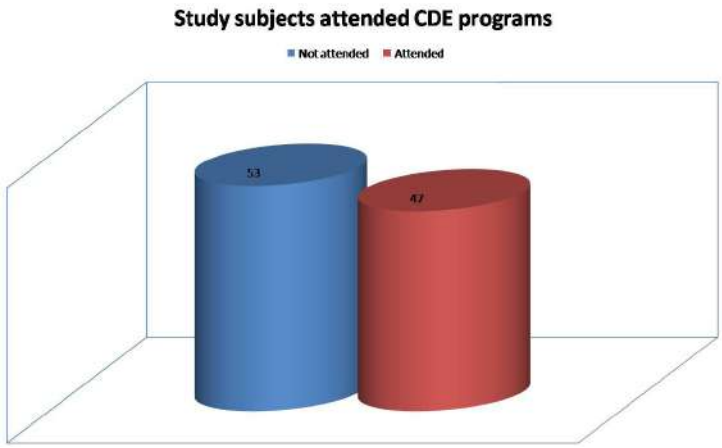
CDE Program	Knowledge Scores					Chi-square value	Df	P value
	Very poor	Poor	Average	Good	Total			
CDE								
Attended	1	12	19	15	47	53.95	3	0.628 (NS)
Not Attended	1	11	29	12	53			
Total	**2**	**23**	**48**	**27**	**100**			

P<0.05 Significant (S); p>0.05 Not significant(NS)

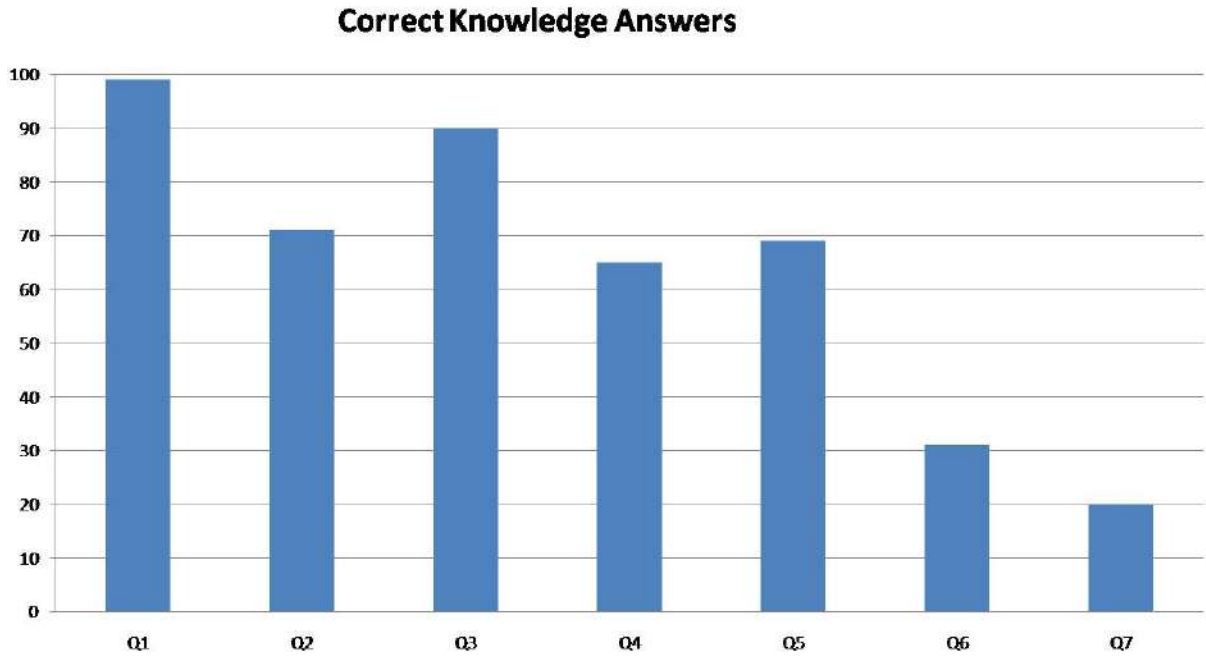
Table 3: Association between CDE program and Practice scores of dental waste management

CDE Program	Practice Scores					Chi-square value	Df	P value
	Very poor	Poor	Average	Good	Total			
CDE								
Attended	0	9	21	17	47	9.83	3	0.0152 (S)
Not Attended	0	12	25	16	53			
Total	**0**	**21**	**46**	**33**	**100**			

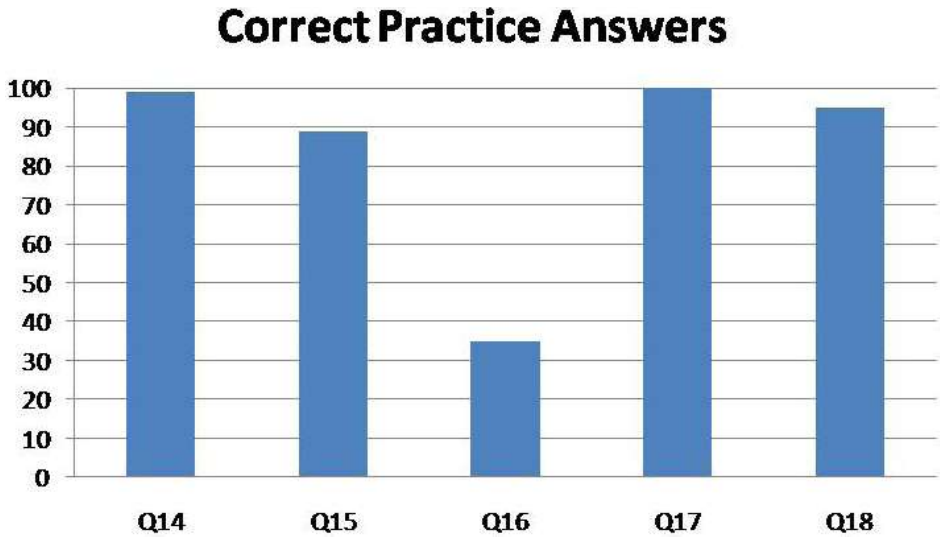
P<0.05 Significant (S); p>0.05 Not significant(NS)



Graph 1: Distribution of Study subjects as per CDE programs attended



Graph 2: Distribution of Respondents by correct Knowledge answers



Graph 3: Distribution of Respondents by correct practice answers

Discussion

Hospital waste generation is a continuous process. This waste needs to be disposed in place or, it may serve to be a potential carrier for various diseases and pollution. A major contribution to this waste is from dental clinics. Dental waste consists of a wide range of materials from amalgam, cements and files to bloody cotton swabs, needles and human anatomical waste.

Although the dental profession is a team effort, management of biomedical waste is done at an individual level. The dental waste travels through the hands of numerous individuals and thus, monitoring of proper disposal is one of the many tasks the dental professional needs to observe. In order to assess the present situation and to gain insight on the efforts that need to be undertaken to help with the cultural needs, a learning instrument (questionnaire) based on the knowledge, attitude and practices of the dentist has been arranged.[1,5] 100 subjects involved in this study, including 80 graduate and 20 post-graduate qualification. 99% subjects reported to be aware of the different categories of biomedical waste and that efficient segregation of this waste was carried out in their practice. While, only 71% of these subjects had knowledge of the color coding given by the biomedical waste management in India. 65% individuals showed knowledge of the use of yellow bag/containers to dispose human anatomical waste.

96% subjects reported to be registered with a certified waste carrier service to recycle or dispose the biomedical waste generated in the clinic. 34% dental clinics were registered with a private biomedical wastage service. Most of the private dental clinics did not show much use of dental amalgam. 69% private dental professionals were aware of mercury spill kit being the most effective way to remove accidental spill of mercury. This result is similar to a study conducted at dental clinics in Karnataka, India.[1] 89% subjects informed that they used needle burn to dispose infected needles.

In the present study, 47% of the participants have attended CDE program based on biomedical waste management, the results of which showed increased awareness and better practice of waste disposal. 78% subjects are willing to attend training on biomedical waste management or think they need more knowledge regarding the issue. Although specialized waste carrier services are available in India, dental professionals and students need to be made accustomed to the availability of these services.

Conclusion

Insufficient professional training regarding this topic becomes a major contributor to the neglect of biomedical waste management. Lack of awareness and interest fails one to register their clinic under certified waste management services. Dentists should be focused not only in delivering healthcare needs up to the mark but also, taking responsibility of the effects of waste generated routinely.

Limitation of Study: As this study was confined to the only single city but this topic is relevant to large regional area so more extensive studies with larger and broader population cohort are required for better assessment and implementation of biomedical waste guidelines.

Conflict of Interest: Nil

Source of Funding: self

Ethical Clearance: Obtained (KIMSDU/IEC/08/2018 dated 17/11/2018)

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Exploring the Role of Hatha Yoga in Altering Dispositional Mindfulness

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Abstract

The present research study was an intervention study conducted to elucidate the effects of different Hatha yoga practices on dispositional mindfulness among young adults not characterized by any clinical condition. 280 participants were assigned to three different Hatha yoga intervention groups and a control group for duration of three months. Baseline and post intervention scores for mindfulness were recorded for all the four groups using the Five Facet Mindfulness Questionnaire. Data was analyzed using analysis of covariance for measuring the mean difference between-groups. A highly significant difference was observed between groups on the ability to observe and describe emotions/inner experiences and act with awareness, all of which are positive indicators of dispositional mindfulness. Analysis of *t*-test revealed maximum significant and positive change in dispositional mindfulness in the combined intervention group of yoga asana and pranayama and meditation, followed by the pranayama and meditation group and the yoga asana group, respectively. Findings reinforce Hatha yoga as a significant predictor of dispositional mindfulness and further contribute to the insufficient literature examining the psychological benefits associated with Yoga among adult masses with no specific clinical condition. It further suggests employing stronger interventional research designs and a mixed-method approach for in-depth assessment of participant experience to accurately evaluate the benefits associated with specific yoga practices and their effects on dispositional mindfulness.

Keywords: *Hatha yoga, mindfulness, FFMQ,clinically healthy adults.*

Introduction

This research is intrigued and inspired by the growing emphasis on Yoga in the effective management of mental health problems and as an aid to improve mental health status.[6,16] Much awareness and popularity is witnessed among the clinically healthy population to adopt Yoga as a medium for advancing health standards, preventing health-related issues, and as a spiritual pursuit. Research identifies Yoga as an integral component of mindfulness-based interventions.[24] Empirical efforts in relation with investigating the effects of yoga-based interventions on mindfulness among young Indian adults have largely targeted an audience characterized with specific conditions associated with aggression[2,4], stress[11], emotional regulation[17], memory and concentration[5], clinical conditions[15], thereby, creating a need to understand the effects of Yoga on dispositional mindfulness among young adults recruited in an intervention without the basis of a clinical condition. Sizeable research efforts in the previous years have been vested into examining Yoga in relation to mindfulness as a single measure.[20] However, a noticeable gap has been identified in literature addressing how Yoga affects different facets of mindfulness independent of each other. This research investigation was conducted with an aim to examine the association between Hatha yoga and the five facet construct of mindfulness.[1] Along with endorsing mindfulness as a multidimensional construct, this study also intended to examine a greater need of its individual subcomponents– observing of emotions/inner experiences, describing of emotions/inner experiences, acting with awareness, non-judging towards emotions/ inner experiences and non-reactivity towards emotions/ inner experiences as critical aids in mental health

promotion among young adult masses characterized with no specific clinical condition.

Materials and Method

Aim: To examine the difference in effects of Hatha yoga practices on five facets of mindfulness among young adults characterized with no specific medical condition.

Objectives: To investigate the mean difference between groups– (I) yoga asana (II) pranayama and meditation (III) combined intervention of yoga asana and pranayama meditation, and (IV) control group after 3-months of intervention.

Hypotheses: It is hypothesized that Hatha yoga will play a significant role in enhancing the subcomponents of mindfulness. Further speculations are made that the intervention group III will exhibit most significant and positive effects on five facets of mindfulness as compared to intervention groups I and II, as a result of a composite, more advanced, and systematically designed approach.

Participants: Study recruited 280 participants aged between 25-35 years and selected as a result of convenience sampling. Participants were divided into Intervention Groups (N=210) and Control Group (N=70). The intervention groups were further subdivided into three groups with equal number of participants (70 each), in order to study the difference in effects of three different Hatha yoga interventions– (I) Yoga Asana, (II) Pranayama and Meditation, and (III) Yoga Asana + Pranayama and Meditation. The Control Group (IV) comprised of participants who were not actively engaged in any form of mind-body-spiritual practices or physical exercise. The premises of the intervention was Morarji Desai National Institute of Yoga, New Delhi.

Interventions:

Yoga Asana: The intervention schedule was designed for a period of 3-months with 3 days in a week. Everyday module included theory as well as practical ranging between 2.5-3 hours on an average. The content of theory and practical was evenly distributed and covered over the intervention period.

Pranayama and Meditation: The intervention schedule was designed for a period of 3-months with 3 days in a week. The everyday module included theory as well as practical ranging between 2.5-3 hours on an average. The content of theory and practical was evenly distributed and covered over the intervention period.

Combined Intervention: This intervention incorporated a combination of both, yoga as an as well as pranayama and meditation. The intervention schedule was designed for a period of 3-months with 6 days in a week. This group was given the yoga asana a intervention for 3 days and the pranayama and meditation for 3 days. The module for each day included theory as well as practical ranging between 2.5-3 hours on an average.

Instrument: Data was collected using the preliminary information form standardized by the institution and the Five Facet Mindfulness Questionnaire (FFMQ).[1]

In order to test the hypotheses, the measurement of following dependent variables was required:

1. Observing of Emotions/Inner Experiences
2. Describing of Emotions/Inner Experiences
3. Acting with Awareness
4. Non-Judging towards Emotions/Inner Experiences
5. Non-Reactivity towards Emotions/Inner Experiences

Data Analysis: Data analysis was performed using SPSS 24.0. The analysis involved computation of means and SD. The mean difference between-groups was calculated through ANCOVA along with the effectiveness of the interventions which was ascertained using Paired t-Test.

Results

The results obtained upon analysis of covariance indicated an overall significant difference between groups on the facets of '*Observing'* ($F=4.93$, $p<.01$), '*Describing*' ($F=2.68$, $p\leq.05$), and 'A*cting with Awareness*' ($F=3.30$, $p<.05$), with their corresponding pretest scores used as covariate.

Table 1: Pairwise Comparisons of Post Adjusted Means

Dependent Variable	(I) Groups	(J) Groups	Mean Difference (I-J)	Sig.b
Observing	4	1	-1.13**	0.00
		2	-1.02**	0.01
		3	-0.96*	0.02
Describing	4	1	-0.27	1.00
		2	-0.6	0.12
		3	-0.62	0.09
Acting with Awareness	4	1	-0.43	0.54
		2	-0.67*	0.05
		3	-0.70*	0.04
Non-Judging	4	1	0.33	1.00
		2	0.50	0.70
		3	0.67	0.21
Non-Reactivity	4	1	0.73	1.00
		2	-0.47	1.00
		3	-0.40	1.00

*Significance at 0.05 level, **Significance at 0.01 level

Table 1 presents the post hoc pair wise comparison of adjusted means, indicating a significant difference between each of the intervention groups and the control group for '*Observing'*. A significant difference was also observed between intervention groups II and III and the control group on '*Acting with Awareness*'.

Table 2: Mean Differences within Groups Post Intervention

Representing t-Test for Mindfulness									
S. No.	Pretest-Posttest	IG-I (YA) (N=70)		IG-II (PM) (N=70)		IG-III (YA+PM) (N=70)		CG-IV (CG) (N=70)	
		t	Sig.	t	Sig.	t	Sig.	t	Sig.
1	Observing	2.14	0.04	2.24	0.03	2.18	0.03	1.75	0.08
2	Describing	1.37	0.18	1.94	0.06	2.28	0.03	0.45	0.65
3	Acting with Awareness	2.24	0.03	2.29	0.03	2.40	0.02	1.22	0.23
4	Non-Judging	2.01	0.05	2.35	0.02	2.58	0.01	0.38	0.71
5	Non-Reactivity	2.05	0.04	2.12	0.04	2.30	0.02	1.31	0.19

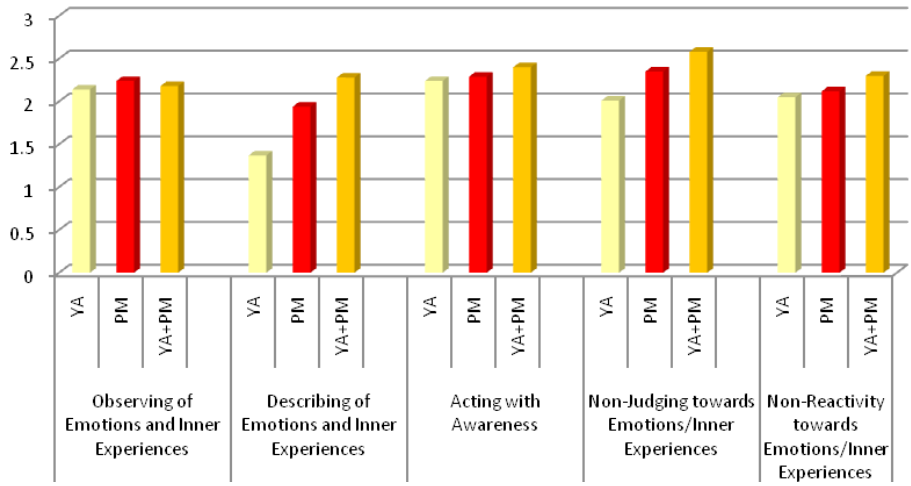

Figure 1: Graph Representing Effects of Intervention in Intervention Groups

Table 2 and Figure 1 validate the speculations made for the group III, wherein findings for within-group difference indicate that this group exhibited greatest significant difference and scored highest on four out of five facets of mindfulness followed by group II and group I, respectively.

Discussion

Analysis of covariance indicated a significant effect on the mean difference between intervention groups on observing emotions/inner experiences, describing of emotions/inner experiences, and acting with awareness post intervention. A common trend is observed across the findings of observing emotions/inner experiences, describing emotions/inner experiences, and acting with awareness, with the intervention group II experiencing most considerable positive change, followed by the intervention group I and III, respectively, in comparison to the control group.

Practices of pranayama and meditation operate primarily on the mind principle to conquer mental processes under voluntary control through the practice of concentrated attention and awareness[23], reinforcing a more significant role of mental faculties in practicing mindfulness. This claim was later reinforced by examining that pranayama and meditation involve greater voluntary control of mental capacities[3] necessitating concentrated breath control, centering of attention on bodily sensations, maintenance of posture, and guided instructions at short intervals; aiming at elevating deeper states of consciousness by reassessing the state of mind[12] and heightening mindfulness.[19] Yogasanas, on the other hand, are a balanced blend of effort and ease, which teaches one to put in efforts to get into a posture, experience relaxation in that posture, and try to detach from the result.[13] They operate on gross body level and are more than just mere physical exercises and a fundamental medium for a deeper understanding of mind and body.[14] Every movement of the body has a direct correlation with the way mind responds to it.[14]

A gain in mean scores of observing emotions/inner experiences after the interventions of pranayama and meditation and yogasana respectively, is attributed to the principles on which these practices operate. Pranayama and meditation are advanced practices with potential to lead to positive effects on observing inner experiences.[21] Yogasanas involve equal engagement of mind and body on the premise of shaping the physiological state of the body to regulate emotions, thoughts, and attitudes[10], thereby maximizing the ability to observe internal and external experiences.

Describing of emotions/inner experiences refer to being able to explain inner experiences in words or label them.[1] Participants reported guided meditation practice in playing an instrumental role in enabling them to reflect upon the experience of different thoughts and emotions and in allowing them to flow freely without fixating the mind on them. Obtained findings are supported with earlier research suggesting a positive impact of yoga and meditation on cognitive functionality.[22] Meditation has reportedly led to a significant decrease in cortisol[7], a hormone which is responsible for having a quietening effect on mind. Lower pace of processing equipped the participants with an increased ability to differentiate between positive and negative affective states, which in turn helped them to attain clarity in thought and be able to identify and label their feelings and experiences with great ease. Active inhalation and exhalation during yogasanas and meditation have the potential to lead to significant structural changes in orbitofrontal and hippocampus regions in brain[8], larger volumes of which may account for positive emotions, retention of emotional stability, and engagement in mindful behavior.[39] Regularity in these practices accounts for habitual changes among practitioners. Research findings indicate an increase in levels of oxygen and serotonin after practicing yogasanas, agents which are chief contributors in channelizing the mind towards experiencing higher positivity, emotional stability, calmness[18], and organization in thoughts.

Obtained findings indicate significant positive effects on acting with awareness, suggesting greater control over thoughts and maximized attention towards the moment in hand after engaging in yoga. Participants reported feelings of a mental slow down post intervention allowing them more time for conscious engagement in everyday actions and self-reflection. This finding may be supported with a research investigation regarding yoga as a complex blend of physical, moral and spiritual practices aiming at attaining self-awareness and working on activating the inner energies to reduce the pace of mental activity, thereby leading to a clear state of mind.[9]

Results of the study add to strength of association between yogasana, pranayama, and meditation, and components of dispositional mindfulness among young adults with no specified clinical condition. Obtained

findings may substantively support yoga-based controlled trials investigating the difference of effects between clinical and nonclinical population groups. A significant chunk of research in mindfulness has examined it as a single overarching construct, with less emphasis on investigating its subcomponents independent of each other. This investigation intended to bridge this gap by studying the five facets of mindfulness in relation with Hatha yoga to find them as independent yet interacting.

Implications: This study implicates adopting a more qualitative approach, such as a well-designed interview method, in gathering knowledge about participant experience after engaging in mind-body-spiritual practices. Considerable research initiatives have been undertaken in support of the health benefits associated with aggregated practice of yogasanas, pranayama, and meditation. Yet the results seem less conclusive of which one would be more favorable. Therefore, this study implicates stronger interventional research designs to provide in-depth insight into benefits associated with specific yoga practices. The study suggests further research incorporating and exploring the effects of extrinsic variables such as length of practice, time of practice and consistency in teaching instruction on psychological components, as these factors are integral to the success of a yoga-based intervention.

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Compliance with Ethical Standards:

Conflict of Interest Statement: Nil

Statement of Ethics and Human Rights: All procedures performed in studies involving human participants were in accordance with the ethical standards of Amity Institute of Psychology and Allied Sciences and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Ethical clearance was received by the research ethics committee of Amity Institute of Psychology and Allied Sciences, AUUP, before commencing the study.

Statement of Informed Consent: Informed consent was obtained from all individual participants included in the study.

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Morphometry of Acromion Process of Scapula with Respect to Gender

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Abstract

Background: Of the wide spectrum of musculoskeletal disorders affecting the shoulder, subacromial impingement syndrome is considered to be quite common. The main objective of the present study is to evaluate the morphometry of acromion and to measure other parameters like acromiocoracoid distance (ACD) and acromioglenoid distance (AGD).

Materials And Method: Study was conducted on 100 male and 100 female adult scapulae. Length and breadth of the acromion, ACD, and AGD were measured using vernier callipers. Measured parameters were tabulated and analysed for statistical significance.

Results: Acromial length, acromial breadth, ACD and AGD varied significantly with sex. Positive correlation was observed between above parameters in male scapulae, whereas positive correlation was seen only between ACD & AGD among female scapulae.

Conclusion: The studied parameters could be help during diagnoses and treatment of shoulder pathologies. They can also be used for forensic and anthropological purposes for determining gender, ethnicity

Keywords: *Acromion, Impingement syndrome, Rotator cuff tears, Acromiocoracoid distance, acromio glenoid distance.*

Introduction

The most common causes of pain and disability in the upper limb are inflammation of rotator cuff tendons and rotator cuff tears that relates to the structure of the acromion[1].

Scapula, large flat triangular bone has thee processes–spine, coracoid, and acromion. Medial aspect of acromion gives attachment to coracoacromial ligament, while the other end of the ligament is attached to coracoid process. These three structures form coracoacromial arch. Tendon of biceps, subacromial bursa, rotator cuff tendons and proximal humerus travel beneath this arch. Subacromial space is defined by the undersurface of anterior third of acromion, coracoacromial ligament and the acromioclavicular joint above and head of the humerus below. Various factors contribute in narrowing of subacromial space which can lead subacromial impingement syndrome (SAIS)[2].

Subacromial impingement syndrome is the most common disorder of shoulder accounting for 44-65% of all the complaints of shoulder pain. Chronic impingement of rotator cuff can result in inflammation of tendons, subacromial bursitis and eventually rupture of tendons[3]. Anterior acromioplasty is the surgical treatment of choice for impingement syndrome which

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includes removal anterior third of acromion and release of coracoacromial ligament[2]. Anatomy of acromion and related structures is important in successful interpretation of shoulder images and carrying out of surgical procedures in pathologies associated with joint[4].

Present study was undertaken to study the morphometry of acromion parameters which influences the subacromial space like length & breadth of acromion, ACD and AGD in male and female scapulae.

Materials and Method

Study was done on 100 male and 100 female dry human scapulae of different people collected from department of Anatomy, KIMS, Bangalore. Only adult scapulae with all ossification centres fused were included, damaged scapulae were excluded from the study. Sexing of the scapulae was done using maximum transverse diameter measured by Vernier callipers. Scapulae with transverse diameter more than 105cm were grouped into male scapulae and those with less than 91 cm into female scapulae[5,6,7]. After grouping, in each scapulae following measurements were taken using Vernier's callipers.

1. Anteroposterior length of the acromion along longitudinal axis (Length) - L ph-1
2. Distance between the medial and lateral border of the acromion at the midpoint of insertion of acromio clavicular ligament (breadth) - B ph-2
3. Acromio coracoid distance ACD - distance between acromion and coracoid process along an imaginary line representing the midpoint of coracoacromial ligament.ph-3
4. Acromio glenoid distance AGD - distance between inferior surface of acromion and supraglenoid tubercle. Ph-4

Inferior surface of acromion was examined to see whether it is rough or smooth. Each measurement was taken twice and then average was considered to reduce the bias errors. The data obtained is tabulated and statistical analyses were done using Statistical Package for Social Sciences (SPSS) software. Descriptive statistics like percentage, mean and standard deviation were used to analyse the data. The inferential statistics is done using Chi square test, Student't' test and Pearson's correlation test. Microsoft word and excel were used to generate graphs and tables. Values of male and female subjects were compared. The results are considered statistically significant when $p < 0.05$ and highly significant when $p \leq 0.001$.

Photograph 1: Measuring length of Acromion

Photograph 2: Measuring breadth of Acromion

Photograph 3: Measuring ACD

Photograph 4: Measuring AGD

Results

Among 100 male scapulae 64 had rough undersurface and the rest had smooth undersurface. Among 100 female scapulae 41 had rough undersurface while rest of them (59) had smooth undersurface. Statistically significant association was observed between gender and nature undersurface of acromion (table 1).

Table 1: Percentage of male and scapulae with rough & smooth acromion undersurface (*denotes significant association)

Under Surface	Male		Female		χ^2	P-Value
	N	%	n	%		
Rough	64	64%	41	41%	10.607	0.001*
Smooth	36	36%	59	59%		
Total	100	100%	100	100%		

Mean length of acromion was 4.6cm (45.94mm) in male scapulae and 3.9 cm (38.99mm) in female scapulae. Mean breadth of acromion was 2.5cm (25.58mm), 2.3cm (23.09) in male and female scapulae respectively. Both parameters showed statistically significant difference with p<0.001. In male scapulae mean ACD was 2.8cm (28.61 mm) and AGD was 2.7cm (27.5mm), while in female scapulae they were 2.6cm (26.55mm) and 2.6cm (26.01mm) respectively. ACD and AGD showed statistically significant difference in male and female scapulae (p=0.001). All the measured parameters were higher in male scapulae compared to female.

Table 2: Comparison of different parameters of acromion between male and female scapulae

Parameter	Gender	Range (mm)	Mean	SD	SE of Mean	Mean Difference	T	P-Value
L	Male	35.0-56.48	45.94	4.09	0.41	6.950	10.305	<0.001*
	Female	23.0-5.0	38.99	5.36	0.54			
B	Male	19.8-34.0	25.58	2.80	0.28	2.496	5.451	<0.001*
	Female	17.0-46.8	23.09	3.62	0.36			
ACD	Male	17.16-38.6	28.61	4.27	0.43	2.062	3.254	0.001*
	Female	9.0-37.0	26.55	4.69	0.47			
AGD	Male	17.0-38.8	27.50	3.33	0.33	1.496	3.251	0.001*
	Female	16.5-38.8	26.01	3.18	0.32			

Pearson's correlation equation was applied for all measured acromial parameters among male and female scapulae. There was significant correlation among length & breadth, ACD & AGD among male scapulae (p<0.001) (table 3).

Table 3: Correlation between different parameters in male scapulae

Correlations		L	B	ACD	AGD
L	r	1	0.441	-0.066	-0.026
	P-Value	---	<0.001*	0.517	0.795
B	r	0.441	1	0.059	0.127
	P-Value	<0.001*	---	0.559	0.208
ACD	r	-0.066	0.059	1	0.412
	P-Value	0.517	0.559	---	<0.001*
AGD	r	-0.026	0.127	0.412	1
	P-Value	0.795	0.208	<0.001*	---

Among female scapulae significant correlation was seen only between ACD & AGD (table 4).

Table 4: Correlation between different parameters in female scapulae

Correlations		a APL	b TD	ACD	AGD
L	r	1	0.192	-0.165	0.175
	P-Value	---	0.056	0.101	0.081
B	r	0.192	1	-0.005	-0.171
	P-Value	0.056	---	0.959	0.090
ACD	r	-0.165	-0.005	1	0.340
	P-Value	0.101	0.959	---	0.001*
AGD	r	0.175	-0.171	0.340	1
	P-Value	0.081	0.090	0.001*	---

Discussion

With the evolution of bipedal gait and more distal migration of deltoid insertion, scapula has shown enormous evolutionary changes. From being broad and short in pronograde man to long and slender in orthograde man, it has undergone various changes like broad and down sloping acromion, narrow coracoacromial arch and more laterally oriented glenoid cavity. All the above parameters contribute in compromising subacromial space.[8]

In 1972 Neer described impingement syndrome, according to him the anterior inferior part of acromion is the principal site of the disease. Even anterior acromial spur, one of the etilogies of impingement syndrome are due to acquired ossification of coracoacromial ligament, which is inserted to the inferior surface of anterior third of acromion[9]. In our study among 200 scapulae 105 (52.5%) had rough undersurface while 95 (47.5%) had smooth undersurface. In the literature Paraskevas reported rough undersurfaced acromion in 51 (57%) and smooth undersurfaced acromion in 37(42%) studied scapulae[10]. In other two studies done on Indian population Singh et al and Gupta et al found the undersurface of acromion to be rough in 57(44%) and 45 (90%) scapulae respectively, whereas the undersurface of acromion was smooth in 72 (55.8%) & 5 (10%) respectively[11,12].

Morphometry of acromion is an important factor implicated in the impingement syndrome of shoulder joint[13]. In our study mean acromion length recorded was 42.46mm which is agreement with all other studies like Paraskevas et al(46mm), Mansur et al (46mm), Sushmitha et al (41mm), Musa et al (45.85mm) except a study done on Chile population by Collipal et al where they reported length of acromion to be 65.8mm[10,13,14,15,16]. Mean breadth of acromion reported in our study was 24.33mm and it is in agreement with that of other studies like Paraskevas et al (22.3 mm), Mansur et al (26.9 mm), Sushmitha et al (21.8mm), Musa et al (23mm) and Collipal (24.5mm)[10,13,14,15,16]. In the literature acromio coracoid distance showed wide spectrum of measurement 15.48mm (Musa et al) – 39.6mm(Collipal et al[15,16]. In our study ACD was 27.58mm which is in consistent with one more Indian study where they found it 28.4mm[14]. Lowest AGD was recorded by Parakevas (17.7mm) and highest by Mansur et al (31.9mm). In our study mean AGD was found to be 26.75mm, which is again in consistent with that recoreded by Sushmitha et al (26.2mm)[14].

In the literature there are various studies regarding comparison of acromion morphometry in right and left scapulae but there are very few studies which throws light on sexual dimorphism of acromion morphometry (table 5).

Table 5: Comparison of acromion parameters with other studies with respect to gender

Study	Length		Breadth		ACD		AGD	
	Male	Female	Male	Female	Male	Female	Male	Female
Nicholson[9]	48.5	40.6	19.5	18.5	-	-	-	-
Paras[10]	48.3	43.9	22.6	22	28.9	27.3	17.9	17.5
Von Schroeder[17]	50.7	43.6	22.9	20.4	28.7	24.6	16.1	14.9
Present Study	45.9	38.9	25.5	23	28.6	26.5	27.5	26

The mean value of length of acromion in both male and female scapulae is less compared to other studies[9,10,17]. But higher values are recorded for the breadth of the male scapulae compared to other studies[9,10,17]. Acromio coracoid distance is almost in agreement with values recorded in previous studies[10,17]. Higher values are recorded for acromioglenoid distances for both male and female scapulae compared to other studies[10,17]. Higher values of ACD & AGD enables the subacromial structures to glide smoothly within the subacromial space. These differences in the measured parameter among various studies could be because of study sample, different specimens and method followed.

There are many studies in the literature about the types of acromion and its morphometry. Few authors have correlated the acromion morphology of right and left scapulae. But there are very limited studies which throws light on sexual dimorphism of acromion morphometry. In this aspect our study stands unique in which we have compared the length, breadth, ACD & AGD among male and female scapulae and there is statistically significant difference of the above parameters with respect gender. Knowledge of morphometry of acromion and significant difference with respect to gender helps clinicians in diagnosing and planning for the treatment of subacromial pathologies. Morphometry of acromion process is also of interest to the anthropologist while studying about bipedal gait & evolution of erect posture in man.[14]

Conclusion

Morphometric parameters of acromion and its sexual dimorphism is quite important in diagnosing and treatment of subacromial pathologies. Morphometric analysis of acromion provides an additional knowledge for better understanding of shoulder disorders and treatment especially while planning acromioplasty.

Conflict of Interest: None

Financial Assistance: Nil

Ethical Clearance: As the study involved only dry scapulae, it was exempted.

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Evaluation of Knowledge and Attitude of Undergraduate Medical and Dental Students towards Integrative Medicine and Integrative Dentistry: A Questionnaire Study

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Abstract

Background: Integrative medicine (IM) and Integrative Dentistry (ID) is healing-oriented medicine that takes account of the whole person (body, mind, and spirit), including all aspects of lifestyle. It emphasizes the therapeutic relationship and makes use of all appropriate therapies, both conventional and alternative. It includes Ayurveda, Acupuncture, Chiropractic, Dietary supplements, Reiki, Homeopathy, Massage therapy, Hypnotherapy,etc

Methodology: A self-validated questionnaire study was conducted amongst 600 undergraduate (Indian and Malaysian) dental and medical students to evaluate their knowledge and attitude towards IM and dentistry.

Results and Statistical Analysis: The preclinical Indian and Malaysian students showed similar responses to the IM related questions but for ID questions there were varied responses, although not statistically significant different. When the preclinical and clinical dental students were compared, there were differences in the answers for ID related questions. However there was no statistical significance.

Conclusion: Although the students are aware and would recommend IM to their patients, the knowledge and attitude towards ID still needs to be explored.

Keywords: *Holistic approach, Indian and Malaysian students, Integrative Dentistry, Integrative Medicine, Knowledge and Attitude.*

Introduction

Integrative Medicine (IM) and Integrative Dentistry (ID) is healing-oriented medicine that takes account of the whole person (body, mind, and spirit), including all aspects of lifestyle. It comprises of all appropriate therapies, both conventional and alternative medicine. It includes Ayurveda, Acupuncture, Chiropractic, Dietary supplements, Reiki, Homeopathy, Massage therapy, Hypnotherapy etc.[1] It is well understood that no single system of therapeutic medicine addresses a disease completely. Allopathic medicine has its own disadvantage in being ineffective in disease prevention and adverse drug reactions. This has led to increase in IM treatment approaches[2]. It adopts a humanistic approach to treatment of a disease emphasizing on therapeutic approaches that match the individual's global perspective.[3,4] In a study conducted in Israel, It was noted that family physicians play a central role in referring patients to complementary and alternate medicine(CAM). The Practitioners should learn how to communicate and

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collaborate effectively with CAM practitioners for the benefit of their patients[5]. Conventional dental treatment provides only symptomatic management such as restorations, orthodontic corrections, oral prophylaxis, periodontal therapies, extractions followed by prosthetic rehabilitation, without targeting much on the actual etiology causing the problem. This questionnaire study was conducted to evaluate knowledge and attitude of undergraduate medical and dental students towards IM and dentistry.

Methodology

A self validated questionnaire study following the Institution ethics committee approval (IEC 393/2016) was conducted amongst 600 undergraduate (Indian and Malaysian) dental and medical students to evaluate their knowledge and attitude towards IM and dentistry. It was conducted during the regular class hours after obtaining an informed consent from the volunteering students.

Results

The response rate of the study was 98%. There were 17 questions with different scale of answer options. The data obtained was cross tabulated and chi square test was done using SPSS software version 20. There were similar responses to questions related to the knowledge about IM and ID amongst the students (Figure 1,2). However, the responses regarding the attitude and willingness to adapt the same into the regular practice were varied. The results showed that the preclinical Indian and Malaysian students showed similar responses to the IM related questions (Figure 3-6). but for ID questions there were varied responses, although not statistically significant different. When the preclinical and clinical dental students were compared, there were differences in the answers for ID related questions. However, there was no statistical significance.

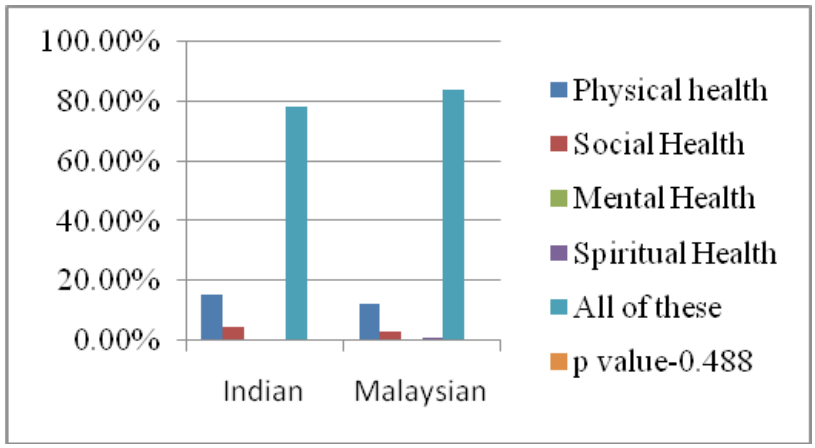

Figure 1: Physician's role is primarily to promote

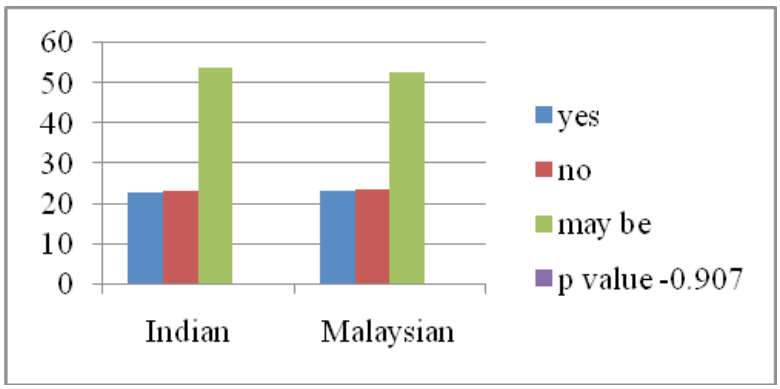

Figure 2 Can Incurable diseases be treated with alternative medicine/therapies

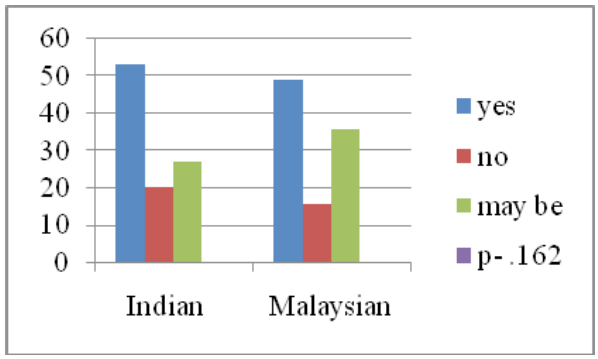

Figure 3 Do you recommend Subtle energy fields for medical therapy

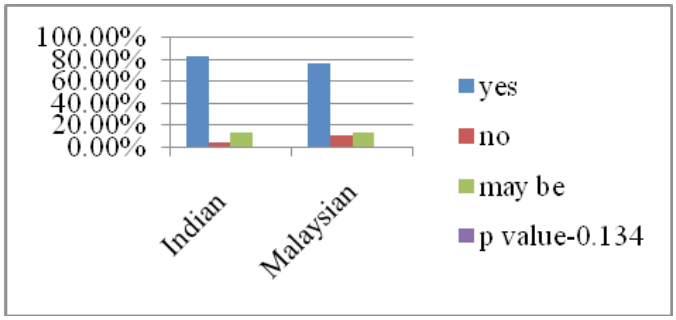

Figure 4 Do you think physicians should have knowledge about both conventional medicine and alternative therapy

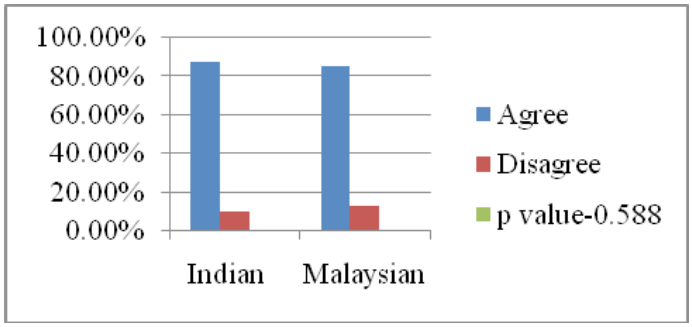

Figure 5 Do you think formation of a Heath center that combines all the conventional & Alternative therapies as an integrated approach will promote overall wellbeing of patients

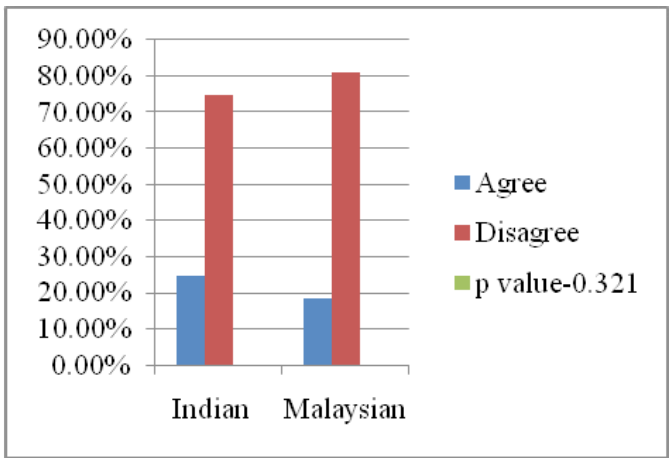

Figure 6 Proper diagnosis and treatment plan plays no role as long as oral lesions such as epulis, gingival inflammation,oral ulcers are healed using homeopathic/ayurvedic medicines

Discussion

In the present study, it is noted that the Indian as well as the Malaysian students are well oriented towards IM and ID. However the attitude towards ID is neutral. Another similar study shows that there is much need to improve the orientation of dental professionals towards IM, although they do not specify ID[6]. The Malaysian dental students have also supported the integration of CAM education in the dental curriculum[7]. In our study, it is seen that the attitude of students towards IM and ID was neutral. Many of them were not sure of using IM and ID into practice. In an Irish study, a satisfactory response rate was seen regarding the attitudes of undergraduate medical students towards the use of CAM, the relevance of IM, and their incorporation into the medical curriculum[5]. It can be attributed to the lesser clinical evidences available on success or failure of ID. Further, in this study there was no difference in the responses of preclinical and clinical students. Although in our curriculum we have not incorporated IM and ID, technological advances and globalization has probably led to a similar responses. However in a previous study it was seen that the junior medical students were more positive toward CAM and its instruction than senior medical students[8]. As the student gets exposed more to allopathic techniques and procedures during the last year of medical school, their attitudes toward CAM decreases. [9]

Majority of the students felt that IM knowledge is necessary to be a well-rounded professional and there should be a health center that combines all the conventional & Alternative therapies as an integrated approach will promote overall wellbeing of patients. This is also supported by many other studies conducted other parts of the world.[10,11,12]

Conclusion

Although the students are aware and would recommend IM to their patients, the knowledge and attitude towards ID still needs to be explored.

Conflicts of Interest: The authors deny any conflicts of interest.

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Antibacterial Activity of Combination between Probiotic Milk and Mango Honey Against Streptococcus Mutans

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Abstract

Background: *Streptococcus mutans* commonly found in oral cavity and can be a pathogenic bacteria that leads to dental caries. Rinsing the oral cavity with antibiotic oral therapy is not suggested as the treatment of dental caries, because it has side effects. It can cause resistance of *Streptococcus mutans* towards antibiotic.

Objective: To analyze the antibacterial activity of honey of mango, prebiotic milk, and the combination of both against *Streptococcus* mutans bacteria

Method: The antibacterial activity test was performed by agar diffusion method with Müeller Hinton agar medium to determine the minimal inhibitory concentration inhibition (MIC). A study had been conducted on the antibacterial activity of the combination of honey of mango and probiotic milk of *Lactobacillus paracasei* ATCC BAA52 on the growth of *Streptococcus mutans*. Fermented milk was made by inoculating *Lactobacillus paracasei* ATCC BAA52 fermented milk, mango honey and their combination at optimum ratio (propotition) into fresh milk at 45°C, then incubated for 24 hours at room temperature

Result: The result of probiotic milk characterization showed that the pH of probiotic milk decreased compared to fresh milk from from pH 6.33 to 3.89. Furthermore, the MIC of each samples against *Streptococcus mutans* were determined

Conclusion: Combination between mango honey (*Mangifera indica*) and probiotic mlik (*Lactobacillus paracasei* ATCC BAA52 can give optimum anti bacteria activities against *Streptococcus mutans*

Keywords: *Antibacterial activity, probiotik milk of Lactobacillus paracasei ATCC BAA52, Mango Honey, Streptococcus mutans.*

Introduction

Streptococcus mutans is a facultative anaerobic bacterium, gram positive cocci bacterium. It is commonly found in human oral cavity and being the most pathogenic bacteria which causes dental caries [(1)]. The characteristics of *S. mutans* are acidogenic, which produces acid, acidoduric, which is capable surviving in an acid environment, and capable to produce a sticky polysaccharide, called dextran. *S. mutans* can adhere to the dental enamel and promote other acidoduric bacteria towards dental enamel, which leads to dental caries [(1).]

Rinsing the oral cavity with liquid containing antibiotic is one of solution to prevent dental caries. Unfortunately, it can not prevent dental caries compeletely because it has side effect that leads to that antibiotic resistance[(2)]. To avoid the antibiotic resistance, scientists nowadays develop extracts and biological active compounds isolated from nature that used for herbal medicine [(3)].

Exploring the probiotics usage is one of the ways to resolve that problem. Probiotic contains hydrogen

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peroxide (H_2O_2), organic acids, and peptide compounds namely bacteriocin which are active as antibacterial[4]. Probiotic milk *Lactobacillus paracasei* has ability to inhibit the growth of pathogenic bacteria *S. mutans* in its host[5]. Consuming probiotics regularly can inhibit the growth *S. mutans* without causing side effects.

In addition to probiotics, currently it has been developed the treatment using natural ingredients that have activity as antimictobial, on of which using honey. Honey is a sweet liquid that derived from plant nectar, which processed by bees and stored in honeycomb cells[4]. The high consentration of sugar in honey, which is 38.5% fuctose, can cause hipertonic condition that promotes bacterial cell plasmolysis. It results inhibiting bacterial growth and promoting bacterial cell death[6]. The carbohydrates in honey are in the form of reducing sugars, which are glucose and fructose, with minimum content is 65% [7].

Both probiotic milk and honey have antibacterial activity with different mechanism[8]. Probiotic milk *Lactobacillus paracasei* contains hydrogen peroxide (H_2O_2), organic acids, and peptide compounds namely bacteriocin which are active as antibacterial[9]. Honey also has ability to inhibit the growth of phatogenic bacteria, such as *E. coli, Listeria monocytogenes,* and *S. aureus,* which is influenced by the concentration of reducing sugars and high concentration of sucroses in honey [6].

Probiotic milk *Lactobacillus paracasei* and honey of mango *Mangifera indica* have a different ingredient, which is active as antibacterial. This study will observe the antibacterial activity of combination of probiotic milk *Lactobacillus paracasei* and honey of mango *Mangifera indica* in various ratio, then it will be found the combination of both ingredients in certain ratio which has maximum antibacterial activity[10]. The purpose of this study is to observe the best ratio of mango honey and probiotic milk to impede the growth of *mutans*.

Materials and Method

Materials: The samples includes, *Lactobacillus paracasei* ATTCC BAA52 honey mangoes and *Streptococcus mutans*. The media was *de Man Ragosa Sharpe Agar* (MRS) (Himedia Lab), Müeller Hinton Agar (OXOID), NaCl (Pa Merch), clindamycin antibiotic (p.g.) as positive control group, and sterile destilled water from the Microbiology Laboratory.

Equipment: The equipment that used in this study were analytic scales (Sartorius BL10S), incubator (Menmert), Öse (Sengkelit), ring (Silinder), vernier caliper (Jason), vortex (Maxi Mix II Type 37600), micro pipette (Socorex), autoclaf (Huxley HL-340), spectrophotometer (Parkin Elmer Lambda EZ201), ependorf, *shaker, colony counter, centrifuge* (EBA 20), Oswald viscocity-meter, *Cup and Bob* viscocity meter, pH meter (Schott glass mainz tipe CG 842), *laminar air flow cabinet,* petri dish and the other laboratory glassware.

Results

Table 1: The minimum inhibitory concentration of probiotic Lactobacillus paracasei against Streptococcus mutans in various concetrations (% v/v)

Probiotic Milk Concentration (% v/v)	The diameter of inhibitory zone against Streptococcus mutans (mm)			Mean ± SD
	Replication 1	Replication 2	Replication 3	
100	15,35	16,40	15,75	15,38 ± 0,53
90	14,10	14,95	15,05	14,70 ± 0,52
80	11,75	12,05	11,55	11,78 ± 0,25
70	11,60	11,85	11,05	11,50 ± 0,41
60	11,05	11,75	10,80	11,20 ± 0,49
55	11,00	10,50	10,45	10,65 ± 0,30
Control (+)	26,75	26,70	27,20	26,88 ± 0,28

The results showed the minimum inhibitory concentration of probiotic milk *Lactobacillus paracasei* against *Streptococcus mutans* is 10.65 + 0.30 mm at concentration 55%. It can be interpreted if the concentration of probiotic milk *Lactobacillus paracasei* was less than 55%, so it could not inhibit the growth of *Streptococcus mutans*.

Table 2: The minimum inhibitory concentration of honey of mango in various concentration (% v/v)

Concentration of honey of mango (% v/v)	The diameter of inhibitory zone against Streptococcus mutans (mm)			Mean + SD
	Replication 1	Replication 2	Replication 3	
50	14,80	16,55	17,35	16,23 + 1,30
25	13,50	13,20	12,00	12,90 + 0,79
12,5	-	-	-	-
6,2	-	-	-	-
3,1	-	-	-	-
1,6	-	-	-	-
Control (+)	26,75	26,70	27,20	26,88 + 0,28

The result shows that the minimum inhibitory concentration of honey of mango was 10,40 + 0,96 mm at concentration 17.5% against the growth of *Streptococcus mutans***.** It can be interpreted if the concentration of honey of mango solution that was less than 17.5%, could not inhibit the growth of *Streptococcus mutans*.

Table 3: The minimum inhibitory concentration of honey of mango in various concentration (% v/v)

Concentration of honey of mango (% v/v)	The diameter of inhibitory zone against Streptococcus mutans (mm)			Mean + SD
	Replication 1	Replication 2	Replication 3	
22,5	11,95	11,80	12,40	12,13 + 0,24
20	11,50	11,20	10,05	10,91 + 0,77
17,5**	9,50	11,40	10,30	10,40 + 0,96
15	-	-	-	-
Control positive	26,75	26,70	27,20	26,88 $\pm$ 0,28

The measurement diameter of inhibitory zone of combination honey of mango and probiotic milk *Lactobacillus paracasei* against tested bacterial in various concentration is displayed in Table 5 and Figure 4. The test of antibacterial activity of the combination honey of mango and probiotic milk *Lactobacillus paracasei* was conducted at ratio 1:9, 2:8, 3:7, 4:6, 5:5, 6:4, 7:3, 8:2, 9:1. The antibacterial activity was determined by the clear zone around hole, that could be measured. To obtain the combination which had maximal antibacterial activity could be done by measuring the diameter of inhibitory zone using Varnier Caliper[9].

Table 4. The antibacterial activity of the combination honey of mango and probiotic milk Lactobacillus paracasei against Streptococcus mutans at vairous ratio (% v/v)

The ratio of (% v/v) honey of mango solution 50% : probiotic milk	Diameter of Inhibitory Zone (mm)			Mean	SD
	Replication 1	Replication 2	Replication 3		
1:9	15,75	14,50	15,40	15,22	0,64
2:8	14,10	16,35	14,20	14,88	1,27
3:7	15,15	15,65	15,30	15,37	0,25
4:6	12,50	12,90	13,50	12,97	0,50
5:5	14,80	14,10	16,10	15,00	1,01
6:4	14,30	16,15	14,40	14,95	1,04
7:3	16,05	15,95	16,35	16,12	0,21
8:2**	17,35**	16,90**	17,10**	17,12**	0,22**
9:1	15,30	16,85	17,50	16,55	1,13
Honey of mango solution 50%	14,80	16,55	17,35	16,23	1,30
Probiotic milk L. paracasei 100%	12,95	14,50	14,15	13,87	0,81
Control positive	18,15	18,10	18,10	18,12	0,03

Discussion

The result of this research shows the positivity. The combination of honey of mango and probiotic milk *L. paracasei* at the ratio 8:2 showed the optimum antibacterial activity against *S. mutans,* with diameter of inhibitory zone as 17,12 + 0,22 mm. Based on statistical analysis using one way ANOVA, the combination honey of mango and probiotic milk *L. paracasei* at the ratio of 8: 2 did not show a significant difference in antibacterial activity compared to the inhibition zone of 50% honey of mango solution. Despite the diameter of inhibition zone of probiotic milk *L. paracasei* is greater than the diameter of inhibition zone of a honey of mango solution. However, when compared to the inhibitory zone of probiotic milk *L. paracasei*, there were significant differences in antibacterial activity [11].

The result shows that there was a decrease in the diameter of the inhibition zone along with the decreasing concentration of honey of mango. It can be seen from the diameter of the inhibition zone produced by 50% and 25% honey of mango of 13.03 + 0.15 mm and 13.03 + 0.57 respectively. While the concentration honey of mango below 25% did not produce antibacterial activity. The test results showed that the MIC of mango honey solution to *S. mutans* was at a concentration of 17.5% with a inhibition zone diameter of 10.40 + 0.96 mm.

After that, the determination of MIC in probiotic milk *L. paracasei* was carried out at various concentrations, namely at concentrations of 100%, 90%, 80%, 70%, 60%, 55%, 50%, 45%, 25%, 12.5%, 6.2%, 3.1% and 1.6%. In the result was found that the MIC of probiotic milk *L. paracasei* against *S. mutans* was at a concentration of 55%, with a inhibition zone diameter of 10.65 + 0.30 mm. By knowing the MIC of probiotic milk *L. paracasei* at a concentration of 55%, it proved that probiotic milk *L. paracasei* has a smaller antibacterial activity compared to honey of mango which has MIC at a concentration of 17.5% [12].

The result showed the combination honey of mango and probiotic milk *L. paracasei* at the selected ratio was 25% with inhibition zone diameter 13.03 + 0.57 mm against *S. mutans*. When compared to MIC each sample of honey of mango and probiotic milk *L. paracasei*, it can be said that the combination of honey of mango and probiotic milk *L. paracasei* at the selected ratio has a minimum inhibitory concentration greater than honey of mango [13]. But it is lower than the concentration minimum inhibition of probiotic milk *L. paracasei*. Then the optimum combination characterization was carried out, which included organoleptic (color, taste odor), pH, viscosity and specific gravity [14]. Based on the results of the selected combination characterization it has a pH of 3.89 + 0.00, the viscosity is 5.33 ± 0.390 cps and the specific gravity is 1.096 ± 0.000 g/mL.

In the combination of honey of mango and probiotic milk *L. paracasei* at the optimum ratio 8:2, there was a synergistic effect even though the concentration of probiotic milk was less than honey of mango [14]. It caused by honey of mango containing more sources which can be used as an energy for probiotic bacteria *L. paracasei*. In a combination honey of mango and probiotic milk *L.paracasei*, honeyof mango can play a role in two things, namely as an energy source for probiotic milk bacteria *L. paracasei* or can inhibit the growth of probiotic milk bacteria *L. paracasei* [15]. This study examnies the effect honey of mango on the growth of probiotic bacteria *L. paracasei*, proved that mango honey did not inhibit the growth of probiotic bacteria *L. paracasei*.

The analysis of antibacterial activity in this study using difusion method, because of its advantages. This method is quite simple, does not require long time and preparation, and can also be used to see the senstivity of antibacterial samples at certain concentratiom of various types of tested bacteria [16]. The standard solution used in this study was clindamycin with a concentration of 0.01 ppm which was previously optimized for the antibacterial activity of clindamycin with various concentrations of *S. mutans* [3]. A concentration of 0.01 ppm was chosen because at concentrations above 0.01 ppm clindamycin produced a diameter of the inhibition zone that was too large which could lead to difficulty of measuring the diameter of the sample inhibition zone. Clindamycin is chosen as a standard solution or positive control because it is an effective antibacterial used to cure tooth damage due to the growth of Streptococci bacteria [17].

Conclusion

Based on the results of this study, it can be concluded that the Minimum Inhibitory Concentration (MIC) of probiotic milk *Lactobacillus paracasei* ATCC BAA52 on *Streptococcus mutans* was 55%, with inhibition zone diameter of 10.65 + 0.30 mm. Minimum Inhibitory Concentration (MIC) of honey of mango solution against *Streptococcus mutans* was 17.5%, with inhibition zone diameter 10.40 + 0.96 mm.

Minimal Inhibition Concentration (MIC) combination of honey of mango (*Mangifera indica*) and probiotic milk *Lactobacillus paracasei* ATCC BAA52 at a ratio of 8: 2 to *Streptococcus mutans* by 25% with inhibition zone diameter 13.03 + 0.57 mm.

Ethical Clearance: This research process did not involve any participant in the survey, but instead using agar diffusion method in laboratory in accordance with the ethical research principle based on the regulation of research ethic committee. The present study was carried out in accordance with the research principles. This study implemented the basic principle ethics of respect, beneficence, non-maleficenct, and justice.

Conflict of Interest: There is no report about any conflict related with this author's research.

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Prevalence of Premarital Sex among Adolescents in Kulende, Sango in Ilorin South Local Governmrnt Area, Kwara State, Nigeria

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Abstract

Premarital sex is explained as a penetrative vaginal or anal sexual intercourse performed between couples before formal marriage. It is characterized as being unanticipated, unpredictable, inconsistence with values and personality, uncontrollable and becoming the common feature of adolescents. This study investigated (i) peer pressure and (ii) poor parents-adolescent communications as factors influencing premarital sex among adolescents in Kulende, Sango, Ilorin South Local Government Area, Kwara State, Nigeria. A descriptive research design of survey type was employed for this study. The population for the study comprised of all Adolescents in Kulende, Sango, Ilorin South Local Government Area, Kwara State, Nigera. A multistage sampling technique was used for the study. Simple random sampling technique was used to select four two hundred (200) respondents for the study. Researcher's designed structured questionnaire which was validated by four experts from the Departments of Health Promotion and Environmental Health Education; University of Ilorin. A correlation co-efficient of .75r was obtained through test re-test method using Pearson Product Moment Correlationon respondents outside the study sample. Data collection was conducted by the researchers and four trained research assistants. The two postulated null hypotheses were tested using the inferential statistics of chi-square @0.05 alpha level. The finding of this study revealed that i. Peer Pressure influenced premarital sex among adolescents in Kulende, Sango, Ilorin South Local Government Area, Kwara State, Nigeria with the calculated chi-square (χ^2) value of 159.842 is greater than the table chi-square (χ^2) value of 16.92 at the freedom (df) 9 @ 0.05 alpha level and ii. Poor Parents-adolescents communications influenced premarital sex among adolescents in Kulende, Sango, Ilorin South Local Government Area, Kwara State with the calculated chi-square (χ^2) value of 165.853 is greater than the table chi-square (χ^2) value of 16.92 at the freedom (df) 9 @ 0.05 alpha level. Based on the findings of the study it was concluded that peer pressure and poor parents-adolescent communication influenced premarital sex among adolescents in Kulende, Sango, Ilorin South Local Government Area, Kwara State, Nigeria. Therefore,it was recommended that i. teachers and school guardians should sensitize their students on the influence of peers in the engagement of adolescents in premarital sex and ii. parents and guardians should take it as their responsibility to create an intimacy, a good relationship and communication skills with their children as this will limit adolescent's early exposure to premarital sex.

Keywords: *Prevalence, Premarital, Sex and Adolescents.*

Introduction

Sex is one of the most profound emotionally charged, mysterious experiences that mortals have. Its necessity and importance in proper adult's physical and emotional functioning is incontrovertible. However, in order for it not to have negative consequences, there is need to apply caution and restraint. Sexual activities among adolescents have been reported to be increasing worldwide. Several studies in sub-Saharan Africa have also documented high and increasing premarital sexual activities among adolescents[9]. Premarital sex is an act of deviation, it is a departure from social norms that attract

social disapproval which is likely to elicit negative sanctions[1].

Furthermore, Pre-marital sex is explained as a penetrative vaginal or anal sexual intercourse performed between couples before formal marriage. It is characterized as being unanticipated,unpredictable, inconsistence with values and personality, uncontrollable and becoming the common feature of adolescents. More than half of the world population constitutes young people that are less than 25 years old, and majority of the populations live in developing country. Starting from a recent time, premarital sexual action during adolescence and emerging adulthood leads to a wide range of adverse outcomes in sub Saharan Africa which include unintended pregnancies, illegal abortions, and sexually transmitted Infections[10].

Premarital sex and early initiation of sexual activity may prolong the period of exposure to risks of unwanted pregnancy and contracting Sexually Transmitted Diseases (STDs) such as HIV/Aids during their reproductive life span[2]. Ethiopia is one of the country where an increasing number of adolescents are involved in unsafe sexual practices and hence face undesired outcomes such as unplanned pregnancy, early childbirth, unsafe abortion and sexually transmitted disease. High level synthesis may be enhanced as a result of an increasingly large number of adolescent's enrolment in preparatory schools[11]. Recently, early initiation to sexual intercourse without having proper protection has been one of the concerns. Adolescents often encounter high risk situations, such as contracting STDs, HIV/AIDS and often experience unintended pregnancy, illicit abortion and its negative sequel[7].

In Southwestern Nigeria, sex before now was regarded as sacred and limited only to adult males and females within marriage but today, many adolescents engage in various delinquent behaviour such as drinking of alcohol, smoking and premarital sexual activities. Furthermore, it was discovered that the prevalence of premarital sex among adolescents was caused as a result of certain social and demographic factors among which include age, gender, parental style, culture, religion, peer influence, among others. Concluded. Among the background variables considered mother education, age, ethnicity and employment status were among the most important predicators of attitudes towards women premarital activity[3].

Peer group influence is another factor that encourages premarital sex.They were of the opinion that young people often face enormous pressure especially from peers to engage in sex. Most information for their knowledge comes from peers of the same sex who may themselves lack adequate information or are incorrectly informed. Growing peer pressure of premarital sex plays major role in sexual decision making among youths[12]. Furthermore, Gender is an important factor in understanding attitudes towards sexual intercourse. It is a factor which is consistent with findings from Asian countries, whereas, premarital sexual activity for boys is considered a socially acceptable rite of passage[8], while girls tend to be labeled and stigmatized, and are often blamed for sexual encounters that result in pregnancy and sexually transmitted infections. It is likely that both girls and boys internalize subtle and overt messages about gender roles from friends, family and society which, in turn, shape different attitudes and beliefs about sexual initiation. However, the process by which gender roles influence the attitudes and beliefs about gender-distinct sexual initiation has rarely been studied, especially in Asian societies that are influenced by Confucianism having doctrines on gender role[5].

Premarital behaviours of adolescents, tend to pose major threats to life and the future of the country as they involved in reckless sexual activities[10]. Public opinion polls have consistently shown that premarital sex is wrong and dangerous to health, resulting in abortions, teenage mothers and sexually transmitted disease. In sub-Saharan Africa, HIV infection is primarily spreading through heterosexual relations. Young people are the most vulnerable to HIV infection. They are also the most affected as they are often called upon to carry the burden of caring for risk family members[4].

Statement of the problem: The researcher observed that the prevalence of premarital sex among adolescents in Kulende, Sango Society in Ilorin South Local Government Area of Kwara State is high, and this leads to high incidence of unintended pregnancies, contraction of sexually transmitted diseases, induced abortion and death. The prevalence of premarital sex among the adolescents is due to the influence of social and demographic factors such as gender, age, family background, peer pressure, parent education, age, ethnicity, socio-economic status, religion, and parents-adolescents communication. The researcher observed that gender is one of the factors influencing the prevalence of premarital sex among adolescent. It was

observed that male adolescents are more engaging in premarital sex than their female counterparts because it was believed that boys are the initiator of premarital sex.

Adolescent is typified by great energy, pursuit of adventure, dating, experimentation with sex and the attendant outcomes most often compromise the young person's sexual and reproductive health. The desire to be regarded as the "macho man" makes boys to start having sex early and to indulge in risky sexual behavior. Most girls are coerced into having sex by adolescent boy friends who want to prove masculinity. Furthermore, the age is also a predicator for the prevalence of premarital sex among adolescents. The researcher observed that most adolescents engage in premarital sex at early ages, and this has caused a lot of serious problem to them because there is no background knowledge of what premarital sex is all about. For this cause, adolescents (11-19years) are under the risk associated with premarital sex such as psychological imbalance, anxiety, feeling guilt and loss of self-respect.

The researcher also observed that adolescents in Sango area of Ilorin South do not have good parent-adolescents communication style such as talk on sex education, sexual health matters among others, and this contributes to the prevalence of premarital sex among them. The supply and amount of parental emotional resources for control can have a significant influence on the youth to have or not to engage in premarital sex. Due to ineffective communication and good upbringing between parents and adolescents, most adolescents are exposed to premarital sex. Also, due to lack of control, the adolescent can contract sexually transmitted diseases or even thought of having abortion that may lead to death or obstetric complications. The researcher also observed that peer influence is also considerable predicting factor for prevalence of premarital sex among the adolescents. Peers like roommates, classmates, club associates and other members of one's social group members equally influence one to be a deviant or conformist. In the cause of peer pressure, most adolescents are lured into the practice of sexual deviant behaviors such as adulteries, alcohol dinking, premarital sex, drug abuse, smoking among others.

These predicting factors has led to various health and emotional issues among the adolescents among which include, dropping out from school, unintended or unwanted pregnancy, contraction of sexually transmitted diseases (Human papilloma virus, herpes, HIV/Aids etc), induced abortion, depression, feeling guilt and shame among others. In this study, the issue of premarital sexual practice among students is fast emerging as a serial social and public health problem. Based on this study the researcher intends to explore the prevalence of premarital sex among adolescents in Kulende, Sango, Ilorin South LGA, Kwara state.

Research Questions:

The following questions were raised to guide this study

1. Will peer pressure influence premarital sex among adolescents in Kulende,Sango, Ilorin South Local Government Area, Kwara State, Nigeria?
2. Will parent-adolescents communication influence premarital sex among adolescents in Kulende, Sango, Ilorin South Local Government Area, Kwara State, Nigeria?

Research Hypotheses:

The following hypotheses were formulated for this study.

Ho1. Peer pressure will not significantly influence premarital sex among adolescents in Kulende,Sango, Ilorin South Local Government Area, Kwara State, Nigeria.

Ho2. Parent-adolescents communication will not significantly influence premarital sex among adolescents in Kulende,Sango, Ilorin South Local Government Area, Kwara State, Nigeria.

Research Methodology:

Descriptive research design of survey type was used for this study. The Population for this study comprised all individuals between ages of 18 to 20 years in Ilorin South Local Government Area, Kwara State, Nigeria. The target population of this study consisted of adolescents in Kulende, Sango Area in Ilorin South Local Government Area, Kwara State, Nigeria.A Multi-stage sampling technique was adopted for this research. Simple random sampling technique was used to select respondents (adolescents) in four (4) Secondary Schools and Market places in Ilorin South Local Government. Purposive sampling technique was used to select adolescents from ages (18-20) due to their maturity. In the second stage proportionate sampling technique of 10% was used for the study. Simple random sampling

technique was used to select the actual respondents for the study. The instrument that was used in collecting data for this research is a researcher designed questionnaire. David (2007) stated that a questionnaire allows the researcher to collect required information quickly and accurately from a large number of people at the same time. The questionnaire titled "Prevalence of Premarital Sex among Adolescents in Kulende, Sango, Ilorin South Local Government Area, Kwara State, Nigeria" consist of two (2) sections. Section A contain demographic information of the respondents, while section B elicit information on prevalence of Premarital Sex among Adolescents in Sango, Kulende in Ilorin South Local Government Area, Kwara State, Nigeria. The items were based on the 4-points Likert scale of Strongly Agreed = 4 (SA), Agreed =3 (A),Disagreed=2 (D),and Strongly Disagreed=1 (SD).In order to ascertain the validity of the instrument, three drafted copies of the questionnaire was given to three (3) experts in Departments of Health Promotion and Environmental Health Education, University of Ilorin, Nigeria. Their suggestions and comments were used to make the final draft of the instrument. The reliability of the instrument was carried out using test re-test technique. Twenty (20) copies of questionnaire were given to twenty (20) respondents outside the case study area after two (2) weeks another twenty copies were administered to the same respondents. The result of the first administration was compared with the second administration using Pearson Product Moment Correlation (PPMC).A coefficient of 0.75r was arrived at which shows that the instrument is reliable for the study. Description statistics of frequency count and percentage was used to analyze the demographic data of the respondents, while non-parametric statistic of chi-square was used to test the four (4) postulated hypotheses at 0.05 alpha level.

Results/Discussion of Findings

Hypothesis 1: Peer pressure will not significantly influence premarital sex among adolescents in Kulende, Sango, Ilorin South Local Government Area, Kwara State, Nigeria. The calculated chi square value of 159.842 was greater than critical table value of 16.92 at the degree of freedom of 9 @ 0.05 alpha level of 0.05, the result of hypothesis one revealed that peer pressure influenced premarital sex among adolescents in Kulende Sango of Ilorin South Local Government Area of Kwara State, Nigeria. This was supported by a research which was of the opinion that young people often face enormous pressure from peers to engage in sex[4].

Hypothesis 2: Parents-adolescents communication will not significantly influence premarital sex among adolescents in Kulende, Sango, Ilorin South Local Government Area, Kwara State, Nigeria. The calculated chi-square value of 149.491 was greater than the critical value of 16.92 at degree of freedom of 9 @ 0.05 alpha level, the result of hypothesis two revealed that parents-adolescents communication influenced premarital sex among adolescents in Kulende, Sango, Ilorin south Local Government Area, Kwara State, Nigeria. The result of this findings agrees with a research which affirmed that frequency of parent-child communication about sex is the most common variable used to study parental impact on adolescent's sexual attitudes and behaviours[6].

Recommendations:

The following are the recommendations based on the outcome of this research;

1. Teachers and school guardians should sensitize their students on the influence of peers in the engagement of adolescents in premarital sex.

2. Parents and guardians should take it as a thing of responsibility to create an intimacy and have a good relationship and communication skills with their children as this will limit adolescent's early exposure to premarital sex.

Ethical Clearance: Taken from Faculty of Education Ethical Review Committee, University of Ilorin. Ilorin, Kwara State, Nigeria.

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Perceived Effect of Sleep Deprivation on the Health of Undergraduates in Kwara State University, Malete, Nigeria

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Abstract

Sleep is a physiological state occurring in alternation with wakefulness, and its duration and quality are equally important for the quality of life, sleep deprivation on the other hand is described as not obtaining adequate total sleep or a condition of not having enough sleep. This study therefore examined the Perceived Effect of Sleep Deprivation on the Health of Undergraduates in Kwara State University Malete Kwara State. The study investigated; (i) Physical Health; & (ii) Mental Health; as Perceived Effect of Sleep Deprivation. A descriptive research design of survey method was used for the study. The population of the study consists of all undergraduates in Kwara State University. A multi stage sampling techniques was used to select 284 respondents for the study, Researcher's designed questionnaire was validated, by the supervisor and three experts from the Department of Health Promotion and Environmental Health Education, University of Ilorin. A correlation co-efficient 'r' of 0.7 was obtained through split half method using Pearson Product Moment Correlation. Data collection was conducted by the researchers and other trained research assistants. The two postulated null hypotheses were tested using the inferential statistics of chi-square @0.05 alpha level. The findings from the study revealed that; i. Sleep deprivation have effect on undergraduates Physical Health with the calc. X^2 value of 247.01 > table X^2 value of 16.92 at the freedom df 9 @ 0.05 alpha level and ii. Sleep deprivation have effect on undergraduates Mental Health with the calc. X^2 value of 132.14 > table X^2 value of 16.92 at the freedom df 9 @ 0.05 alpha level. Based on the findings,it was concluded that sleep deprivation had effects on physical health and mental health, of Undergraduates in Kwara state University, therefore it was also recommended that Undergraduates should be enlightened deeply on the adverse physical and mental health effect that sleep deprivation can have on their health. These can be done through public health sensitisation and advocacy by Federal Government, State Government, NGO's, and the University Lecturers and Health Worker. The mass media and social media also have their part to play in public health education and also religion leaders can also invite health workers to enlighten the entire congregation on the best sleeping practices.

Keywords: *Perception, Effect, Deprivation, Health and Undergraduates.*

Introduction

Sleep deprivation consists either in a complete lack of sleep during a certain period of time or a shorter-than optimal sleep time. The most common causes of sleep deprivation are those related to contemporary lifestyle, school-related factors, and work-related factors; thus the condition affects a considerable number of people. A chronic reduction in the sleep time or the fragmentation of sleep, leading to the disruption of the sleep cycle[11]. Sleep is a major aspect in our everyday lives; however, fewer people are getting enough sleep each night and more are slowly becoming sleep deprived. Sleep deprivation is defined as a condition that occurs when an individual does not get enough sleep each night. We spend almost a third of our life sleeping, Good quality sleep is essential for good health and well-being. However, lifestyle and environmental factors are increasingly causing difficulties in sleeping. Sleep disturbance is frequently considered the most serious consequence of environmental noise[14].

Behaviors such as managing diet, exercising, and getting regular health checks are all important to promoting good health. Likewise, avoiding harmful behaviors like smoking and substance abuse are also very important behaviors. However, unlike these behaviors, there is one behavior that is shared, regardless of background, and socioeconomic status. That behavior is sleep. Like the passage of time, sleep is an absolute part of life. Sleep is also a part of life that is often overlooked as it relates to health. While sleep is as important to life as nutrition, it is often taken for granted, and even considered unimportant or unnecessary. Not only is sleep an absolute requirement for good health, like nutrition and exercise, the amount and type of sleep have a significant impact on both physical, social, and mental health. Poor sleep health is a common problem, with 25% of U.S. adults reporting insufficient sleep or rest at least 15 out of every 30 days[3]. Therefore, as a health behavior, proper sleep has the potential to provide significant health benefits. This is especially true for certain age groups; primarily those in the 18-24-year-old age group who suffer the highest rate of sleep deprivation[8].

Sleep is essential for a person's health and wellbeing. Surveys conducted by the NSF reveal that at least 40 million Americans suffer from over 70 different sleep disorders and 60% of adults' are reported having sleep problems a few nights in a week or more[9]. A Study indicate that sleep problems result from abnormalities in both physiological systems such as: brain and nervous system, cardiovascular system, metabolic functions, and immune system as well as unhealthy conditions such as: hypertension, emotional disorders, obesity, and substance abuse[1].Recent findings show that acute sleep deprivation and looking tired are related to decreased attractiveness and health, as perceived by others. This suggests that one might also avoid contact with sleep deprived, or sleepy looking, individuals, as a strategy to reduce health risk and poor interactions[2].

Furthermore, it is well established that enough and undisturbed sleep are essential for an individual's personal wellbeing and the ability to perform correctly. With the increasing economic and social demands of the modern society, more and more people work and stay active outside the regular day and curtail their sleep. The negative effects of chronic sleep restriction on productivity and Health have begun to appreciate as a Public Health concern, yet are still often underestimated[4]. Nothing seems to bring much clarity to the function of sleep as spending a night without it. When deprived of sufficient sleep, most of us feel sleepy and physically drained, our mood is noticeably flattened if not somewhat dour, and our thinking feels sluggish and unfocused. Even to the non-expert, sleep has obvious importance for sustaining normal functioning at several levels, including basic alertness, emotional experience and a host of complex cognitive processes[13].

In a research study carried out, it was suggested that overall sleep deprivation strongly impairs human functioning. Moreover, they found that mood is more affected by sleep deprivation than either cognitive or motor performance and that partial sleep deprivation has a more profound effect on functioning than either long-term or short-term sleep deprivation. In general, these results indicate that the effects of sleep deprivation may be underestimated in some narrative reviews, particularly those concerning the effects of partial sleep deprivation[5].

However, over the last decades, there has been growing evidence suggesting a strong association between sleep duration and mortality risk, with some evidence suggesting that individuals sleeping between seven and nine hours' nightly, experience the lowest risks for all-cause mortality, whereas those who sleep for shorter or longer periods have significantly higher mortality risks[11]. Insufficient sleep duration has been linked with seven of the fifteen leading causes of death in the U.S. including cardiovascular disease, malignant neoplasm, cerebrovascular disease, accidents, diabetes, septicaemia and hypertension[6].

Finally, insufficient sleep is often the norm among many professions, such as medical residents, military personnel and shift-workers. Thus, scientific study of the effects of sleep deprivation can provide unique insights, not only regarding the nature and function of sleep but also of practical importance for enhancing the Health and wellbeing of workers who must perform optimally despite periods with little to no sleep[13]. Sleep at the same time is well identified as a complex biological process that is a very essential component of human health and wellbeing. The way that sleep is regulated in the body is similar to the manner in which other necessary function are controlled, such as eating and breathing. Sleep pays a vital role in promoting Physical, Mental, and Emotional Health[12]. This study therefore sought to determine the Perceived Effect of Sleep Deprivation on the Health of Undergraduates in Kwara State University, Malete, Kwara State.

Statement of the Problem: Receiving adequate sleep each night ensures proper maintenance of bodily processes. Unfortunately, sleep deprivation is becoming an increasingly common problem in the society today. Many university undergraduates in the society suffer from illnesses resulting in severe sleep deprivation. Many other individuals, however, disregard the need for sleep in order to accommodate the daily activities of life. Sleep deprivation is becoming especially prevalent as longer study hours, medical problems and voluntary behaviour are becoming an acceptable part of undergraduate's culture[1].

The Centers for Disease Control and Prevention (CDC) in the United States has declared insufficient sleep a public health problem. Indeed, according to a recent CDC study, more than a third of American adults are not getting enough sleep on a regular basis[10]. However, insufficient sleep is not exclusively a U.S. problem, and also concerns other industrialised countries such as the United Kingdom, Japan, Germany, or Canada[9]. Everywhere you go, you hear people complain that they are tired and do not have any energy. Students stay up late because they had to work the night before, in order to pay for school, they are trying to finish an assignment that is due the next day, there is some sort of issue at home, or they decided they would rather do some other leisure activity they enjoy rather than go to bed at a more appropriate time. However, studies have shown that sleeping is one of the most important things a person must do. Sleep plays a vital role in learning and when a person fails to obtain enough sleep the night prior, neurons in the brain might not fire properly, the body becomes out of synch, and it can even lead to accidental physical injuries[1].

According to recent evidence, the proportion of people getting less than the recommended hours of sleep is rising and is associated with lifestyle factors related to a modern 24/7 society, such as psychosocial stress, unbalanced diet, lack of physical activity and excessive electronic media use, among[10]. This is alarming as insufficient sleep has been found to be associated with a range of negative health and social outcomes, including adverse performance effects at school and in the labour market[7]. Insufficient sleep duration has been linked with seven of the fifteen leading causes of death in the U.S. including cardiovascular disease, malignant neoplasm, cerebrovascular disease, accidents, diabetes, septicaemia and hypertension[6].

Research Question:

This study aims at answering the following questions:

1. Will sleep deprivation have effect on the Mental Health as perceived by Undergraduates' in Kwara State University?
2. Will sleep deprivation have effect on the Physical Health as perceived by Undergraduates' in Kwara State University?

Research Hypotheses:

The following hypotheses will be tested in this study:

1. Sleep deprivation will not have effect on the Mental Health as perceived by Undergraduates' in Kwara State University.
2. Sleep deprivation will not have effect on the Physical Health as perceived by Undergraduates' in Kwara State University.

Research Methodology: The research design adopted in this study is descriptive research design of the survey type. The population for this study consists of all Undergraduates in Kwara State University, Malete, Nigeria. The population is a total of 14,399 undergraduates, while the target population is a total of 4,734 undergraduates. Multi stage sampling techniques was used for this study. Simple random sampling technique of Fish Bowl method was used to select five (5) colleges out of six (6) colleges in Kwara State University Malete, Nigeria. Purposive sampling technique was used to select the 300 level and 400 level students in all five selected colleges based on their experience and years spent in the university. Proportionate sampling of 6% was used to select the respondent. Simple random sampling technique was used to select the actual respondent for the study. The instrument used for this study is a researcher-designed questionnaire tagged Perceived Effect of Sleep Deprivation on the Health of Undergraduates in Kwara State University. The questionnaire consists of two sections. Section A elicits information on the demographic data of the respondents such as gender, age, marital status etc. while Section B consistof questions formulated from each of the hypotheses in the study. The instrument was presented in a modified four points Likert rating scale of Strongly Agree (SA) = 4, Agree (A) = 3, Disagree (D) - 2, Strongly Disagree (SD) = 1. The instrument was validated

and tested for reliability and a coefficient of 0.7r was obtained which shows that the instrument is reliable for the study. Descriptive statistics of frequency count and percentage was used to analyze the demographic data while inferential statistics of chi-square was used to test the hypotheses set at 0.05 alpha level.

Results/Discussion of Findings

Hypothesis 1: The calculated chi square value of 247.01 is greater than critical table value of 16.92 at the degree of freedom of 9 and significant level of 0.05, the result of hypothesis one revealed that Sleep Deprivation have Effect on Physical Health as perceived by Undergraduates' in Kwara State University, this finding was supported by a findings which affirmed that sleep deprivation of less than 7 seven hours per night may have wide ranging effect on the endocrine, immune and nervous system including obesity in adult and children, diabetes and impaired glucose tolerance, cardiovascular diseases and hypertension, all these mirrors on the physical health of an individual[11].

Hypothesis 2: The calculated chi square value of 132.14 is greater than critical table value of 16.92 at the degree of freedom of 9 and significant level of 0.05, the result of hypothesis two revealed that Sleep deprivation have effect on Mental Health as perceived by Undergraduates' in Kwara State University**.** This was supported by a research which ascertained that sleep deprivation increases your chance for health conditions such as Alzheimer and frequent mental distress, also affirmed that sleep affect our mental health as profoundly as it does to our physical health. Sleep deprivation have been found to have strong connection with practically every mental disorder we know of, especially depression and anxiety[6].

Recommendations: Based on the findings and conclusion of the study, the following recommendations were made.

1. Undergraduates should be enlightened deeply on the adverse physical health effect that sleep deprivation can have on their health. These can be done through public health sensitization and advocacy by Federal Government, State Government, NGO's, and the University Lecturers and Health Worker.
2. Undergraduates should be enlightened deeply on the adverse mental health effect that sleep deprivation can have on their health. These can be done through public health sensitization and advocacy by Federal Government, State Government, NGO's, and the University Lecturers and Health Worker.

Ethical Clearance: Taken from Faculty of Education Ethical Review Committee, University of Ilorin. Ilorin, Kwara State, Nigeria.

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Noise Relationship with Complaints of Disorders of Hearing in Crafts Industry with Iron in Parigi Moutong District

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Abstract

Hearings Invasive complaint constitute complaint that experienced by workers on Industrial Forger diligence at Regency Parigi Moutong effect most obstreperous flat at forger work area. Result of measurement on three dots at base area forges, panjak's area and finishing's area Forger diligence, utilize Sound is Meter Level known by noise intensity zoom varies among 80,3, 82,2, 97,5, 97, 9 and 101,5 dB. Multi Center Study naming Indonesia turns in at 4 invasive supreme South-east Asia states hearings effect noise. If noise exposure happening continually will beget energy loss hears that makes a abode and pulih can't return. This research intent to know noise relationship with hearings invasive complaint on industrial forger diligence at Regency Parigi Moutong. This research gets quantitative character by design Cross sectional with trusty level 95%. Observational result on 60 respondents, 39 among those experience hearing trouble complaints. Protecting tool factor ear (APT) (ρ=0,003), working life (ρ=0,002), so long job (ρ=0,004) and condition of work condition (p=0,003) in reference to hearing trouble complaint. Result observationaling to declare for available relationship among APT'S purpose, working life, so long job and condition of work condition with hearings invasive complaint on worker. Suggested that workers gets to reduce noise presentation by use of ear shielding tool accords default and manage rotation working worker job so long at base area forges by noise intensity the very top.

Keywords: *Protecting tool factor ear, working life, long job, and condition of work condition.*

Introduction

Noise in the work environment is a major problem in occupational health in various countries. At least 7 million people (35% of the total industrial population in America and Europe) are exposed to noisy 85 dB or more[1].

National of Occupational Safety and Health (NOSH) obtained data that NIHL (Noise Induced Hearing Loss) is a major problem in the United States today. In the United States around 10 million adults, and 5.2 million children already suffer from hearing loss due to noise and 30 million more can be affected by dangerous noise every day and as many as 30 million workers are proven to have been exposed to noise that exceeds the threshold value[2].

2012 World Health Organization (WHO) found 360 million (5.3%) deaf people in the world with a proportion of 91% adults and 9% children. This number is dominated in Asia. Southeast Asia has 278 million people suffering from hearing loss, 75-140 million in adults. Whereas in infants, there are 0.1-0.2 million suffering from deafness from birth or every 1,000 live births there are 1-2 babies suffering from deafness. 16% of deafness suffered by adults is caused by noise in the workplace, so NIHL (Noise Induced Hearing Loss)[3] The Multi Center Study (MCS) states that Indonesia is one of four countries in Southeast Asia with a high prevalence of hearing loss, which is 4.6% while the other three countries are Sri Lanka (9%), Myanmar (8.4%), and India (6.3%)[4].

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Based on the results of a preliminary study conducted on blacksmiths using US-628 Sound Level Meter measuring instruments, the value of noise intensity measured in 5 locations of blacksmith craftsmen is 87, 92, 93, 88 and 89 dB. Of the many cases of noise and illness caused by work that occur among workers throughout the world, every 15 seconds there are 153 workers in the world experiencing work-related accidents and diseases. From the results of this problem it is necessary to get good attention and handling considering the high prevalence and consequences.

Material and Method

The type of research used in this study is analytic observational research using a cross sectional approach where this study aims to find the relationship between a situation with other conditions contained in the same population[5]

This sampling is done by using a total sampling method, which is a sampling technique where the number of samples is equal to the population. The sample size in this study was 60 people where the population in this study were craftsmen in 15 places in Parigi Moutong Regency.

Findings:

Table 1: Relationship of Noise with Complaints of Hearing Disorders in the Blacksmith Craft Industry in Parigi Moutong Regency

Causative factor	Hearing Loss Complaints				Total	ρ value
	Having disorders		Not experiencing interference			
	n	%	N	%		
Penggunaan APT						
Not Using	31	79,5	8	20,5	39	0,003
Use	8	38,1	13	61,9	21	
Years of service						
≥ 10 years	32	78,0	9	22,0	41	0,002
< 10 years	7	36,8	12	63,2	19	
Length of working						
≥ 8 hours/day	31	77,5	9	22,5	40	0,004
< 8 hours/day	8	40,0	12	60,0	20	
Conditions of the Work Environment						
≥ 85 dB	23	53,5	20	46,5	43	0,003
< 85 dB	16	94,1	1	5,9	17	

Sumber: Data Primer, 2017

Table 1. The results of Chi Square test ρ value 0.003 (ρ≤0.05) indicate a relationship between the use of APT and complaints of hearing loss, years of work with complaints of hearing loss with a value of ρ value 0.002 (ρ≤0.05), length of work with complaints of hearing loss the value ρ value is 0.004 (ρ≤0.05), the working environment condition with hearing loss complaints is ρ value 0.003 (ρ 5 0.05).

Discussion

Ear Protective Equipment: APD in this case ear protection device is a set of safety tools used by workers to protect the entire body or part of his body from the possibility of potential hazards from the work environment against accidents and work-related diseases acquired during work [6]

The results of research conducted on the blacksmith craft industry in Parigi Moutong Regency showed that the value of ρ = 0.003 (ρ <0.05), H0 was rejected and Ha was accepted, meaning that there was a relationship between the use of ear protectors and complaints of hearing loss.

The results of this study are also in line with research conducted by Hatim M, et al (2015). The results of the analysis show that the values obtained from the Pearson Chi-Square test (p = 0.002), which means that p <0.05 there is a statistically significant relationship between PPE and NIHL in Batu Saw workers on the West-Palestinian Bank. However, this research is not in line with the research conducted by Leancy Ferdiana (2013). The results of the statistical test between the use of headsets in flight and an increase in the hearing threshold indicate a significance value greater than 0.05. This means that there is no significant relationship between the use of headsets with an increase in the hearing threshold of respondents.[7]

Years of Service: The longer the working period of a worker is likely to be more easily exposed to noise in his workplace. If the longer it is in a noisy environment, the more dangerous it is for hearing workers [6]

The results of research carried out on the blacksmith craft industry in Parigi Moutong Regency showed that the value of ρ = 0.002 (ρ <0.05) then H0 was rejected and Ha was accepted, meaning that there was a relationship between years of work and complaints of hearing loss.

The results of this study are in line with the research conducted by Sam et al. (2017). From the results of the study, there was a statistically significant relationship between the length of work and the condition of hearing loss among Small and Medium Business Workers in Selangor, Malaysia, with a score of χ (4) = 10.51, p = 0.033. The level of association as indicated by the Kendall tau-c correlation is positive and weak (p = 0.18). But it is different from the results of research conducted by Defrin, E & Suyanto (2014). The results obtained that the value of p = 0.91 which means the value of p> 0.05 so that there is no significant relationship between years of work with complaints of hearing loss [8 9].

Length of working: Permenakertrans number PER.13/MEN/X/2011 is also mentioned that, time is allowed for exposure to noise of 85 dB is 8 hours. The duration of a day's work based on the Law of the Republic of Indonesia Number 13 of 2003 article 77 (1) is 8 hours a day and 40 hours a week with a minimum half-hour day's rest time[10].

The results of this study are in line with the research conducted by Hatim M, et al (2015). The results of the analysis show that the long duration of the work was obtained with a value (OR 1.08; CI 1.02 -1.14; p = 0.004) which means there is a statistically significant relationship between the duration of work and NIHL on the Edge Stone Workers West-Palestine. But it is different from the results of a study conducted by Suryani et al. (2015). The value of the results of the statistical test with chi-square between the variable working hours per day with hearing sensorineural type disorders obtained X2 = 2,283 and p = 0,273 (0,273> 0,05) which means that there is no significant relationship between working hours per day and sensorineural type hearing loss in noise workers in the Wood Furniture Industry in Pekanbaru City [11 12].

Conditions of the Work Environment: The work environment must be thoroughly evaluated, each workplace must be such that optimal workplace health and work productivity can be realized. Where if the work environment is not always evaluated, the effects that will be caused are workplace accidents and work-related illnesses from the work environment [6]

The results of research carried out on the blacksmith craft industry in Parigi Moutong Regency showed that the value of ρ = 0.003 (ρ <0.05) then H0 was rejected and Ha was accepted, meaning that there was a relationship between working environment conditions and hearing loss.

The results of this study are in line with the research conducted by Tjan et al. (2013). The results of the analysis showed a value of p = 0.032 (p <0.05) which means that there was a significant relationship between the intensity of high noise and hearing loss in workers in Sario District, Manado City, North Sulawesi. But it is different from the results of research conducted by Rusiyanti et al (2012). The results of the analysis show p value = 0.076 (p> 0.05), which can be interpreted as not having a significant relationship between noise intensity and disturbance in the right ear hearing threshold in blacksmith craft industry workers in Hadipolo village, Jekulo District, Kudus Regency [4 13].

Conclusion

The conclusions from the results of this study are as follows: There is a relationship between ear protectors and complaints of hearing loss in the Blacksmith Craft Industry in Parigi Moutong District with a value (ρ = 0.003 <0.05).

There is a relationship between years of work with complaints of hearing loss in the Blacksmith Craft

Industry in Parigi Moutong District with a value (ρ = 0.002 <0.05).

There is a relationship between the length of work and complaints of hearing loss in the Blacksmith Craft Industry in Parigi Moutong Regency with a value (ρ = 0.004 <0.05).

There is a relationship between working environment conditions and complaints of hearing loss in the Blacksmith Craft Industry in Parigi Moutong District with a value (ρ = 0.003 <0.05).

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All subjects were fully informed about the procedures and objectives of this study each subject prior to the study signed an informed consent form.

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The Role of Cultural Social Factor in Decision Making of Choosing Female Family Planning Contraception

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Abstract

The purpose of this research is to determine the factors that influence the decision to choose the female family planning contraception. This type of research is qualitative research by obtaining key informants (family acceptors), supporting informants (husbands) with in-depth interview method. Data analysis is carried out by the method of focused group discussion. The results used are rational motives with only one social variable, namely 'husbands' supports, the informants agree that these social variables do have a strong influence on the contraception selection of the female family planning acceptors.

Keywords: *Female Family Planning Acceptors, Cultural Social, Rational Motive, Emotional Motive.*

Introduction

Family Planning Program is not solely the responsibility of women. The issue of women's empowerment in family planning programs needs to be properly understood so that there is no gender-biased view. However, full involvement and partnership between women and men is important in efforts to control population and improve quality of life. The Family Planning Program (KB) not only aims to improve the health of mothers and children or suppress population growth. However, this family planning program is expected to improve the quality of the population through the preparation of healthy and prosperous families[16]. There is no single method of contraception that is safe and effective for all clients, because each has the suitability and individual compatibility of the client[2],[9],[17]. Along with the development of science and technology that bring many changes to human life both in terms of lifestyle changes and social order including in the health sector which is often faced with a matter that is directly related to the norms and culture adopted by the people living in a certain place[10]. Whereas the embodiment of culture is objects created by humans as cultured beings, in the form of behaviors and objects of a real nature, for example patterns of behavior, language, living tools, social organizations, religion and art, etc., which all of which are intended to help humans carry out community life[7],[23][24].

The large population and population growth rate which is still high or equal to 1.49% and equivalent to 4.5 million people each year is a complicated problem faced by the Indonesian people today[22]. The results of the Population Census show that the population of Indonesia is 237.6 million in 2010. This figure places Indonesia in the fourth rank of the most populous country in the world after the People's Republic of China, India, and the United States. In 2010, around 118.3 million people (50 percent of the population) lived in urban areas. At the same time the initial fertility rate in Indonesia has fallen sharply since the 1980s. The Crude Birth Rate (CBR) is estimated at 28 per 1,000 populations in the period of 1986-1989, down to 23 per 1,000 populations in the period of 1996-1999, resulting in an average decline of 2.1 percent per year [5] [16].

Those numbers indicate that there has been an acceleration in the decline in birth rates. But in 2010, the CBR again rose to 23 births per 1,000 inhabitants. Likewise, life expectancy at birth for both men and women increases. Male life expectancy increased from 58 years in 1990 to 69 years in 2010, and in women, life expectancy increased from 62 years in 1990 to 73 years in 2010. [18]. Regardless of the extent of the Family Planning (KB) program, and the Population of Family Planning and Family Development (KKBPK), the success of the family planning program still refers to the Total Fertility Rate (TFR). The smaller the TFR number, the more successful the KB program is. TFR

can go down when the Contraceptive Prevalence Rate (CPR) rises consistently. Conversely, if CPR does not increase, it is difficult to reduce TFR. CPR itself will not rise if the PB (New Participant) does not rise. CPR in Indonesia has fluctuated from year to year, such as 61.9% in 2012, 60.1% in 2014, and 66% in 2015, so it is appropriate if contraception is placed as a necessity for couples of childbearing age at the same time can improve the health of mothers, infants and children and contribute to the reduction of Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR) so as to help realize a small, happy and prosperous family [5].

Based on the Indonesian Demographic and Population Survey, recorded that TFR this year reaches 2.6 per woman of childbearing age. This means that on average women of childbearing age in Indonesia have an average of 3-4 children. This achievement is far from the target to be achieved this year, which is 2.4. From this year's achievement, the BKKBN admitted that it was almost certain that the opportunity to achieve the ideal TFR in 2015, which is 2.1 was closed. It is believed that TFR is still high due to the high drop out of contraception. The level of participants dropping out of family planning programs is on the road due to the majority of family planning participants currently using non-MKJP contraception, such as short-term pills that are quite high [11].At present, according to the calculations of experts, the ability of the earth to support the existence of the population has been 1.5 times its ideal capacity. In 2050 the condition has doubled andvery worrying[5].

In overcoming the problem of high population growth, the government has implemented a rational, effective and efficient contraceptive use policy including the use of Long Term Contraception Method (MKJP). According to the WHO and American College of Obstetricians and Gynecologists (ACOG), MKJP is the most effective contraceptive method. When viewed from the data, there is a tendency for contraceptive usage patterns to be considered irrational, of which 57.9 percent of the Contraceptive Prevalence Rate (CPR) is 47.3 percent using Non-Long Term Contraceptive Method (Non MKJP) and only 10.6 percent using the Long Term Contraception Method (MKJP).The pattern of use of the Long-Term Contraceptive Method even tends to decrease ie 18.7 percent in 1991 to 10.6 percent in 2012. The high use of Non MKJP also occurs in new family planning acceptors, which is 82.48 percent, while those using MKJP are only 17.52 percent even though the national MKJP target is 27 percent. [5].

In North Sumatra in 2015 showed that the number of PUS (Fertile-Age Couple) reached 2,201,509 people,with the number of active family planning participants amounting to 1,525,388 people (69.29%),while the number of new family planning participants was 419,691 people (19.06%), while the number of dropped-out KB acceptors which is 418,713 people or 18.57%. (Deli Serdang Regency/BPS, 2016). In Deli Serdang District in 2015 showed that the number of PUS reached 337,331 people, with the number of active family planning participants amounting to 232,372 people (68.88%), while the number of new family planning participants was 2,653 (0.78%), while the number of dropped-out family planning was 175,917 (52.14%).Female Surgery Method (MOW) as many as 38 people and Male Surgery Method (MOP) of 29 people [8].The tendency of the Non-MKJP KB use pattern also occurs in North Sumatra Province. Throughout the year 2013, turned out to be not less than 80 percent of new family planning acceptors in West Java chose to use Non-LTM. Non-LTM user is dominated by injectable contraceptives is equal to 33 percent and 29 percent of contraceptive pills [6]. Similarly, the usage pattern in Deli Serdang reported the achievement of KB participants noted of 22 districts in Deli Serdang, active birth control pills the number of participants as much as 23.18 percent, while the number of new family planning participants pills as much as 3.5 percent. Operation Method Women (MOW) as much as 3.4 percent and Operation Method Man (MOP) of 2.6 percent [6].

Theoretical Review:

Social Aspects Affecting Health Status and Health Behavior: Some social aspects that can affect participation in family planning, among them are Age, Education of husband or wife, The work of a husband or wife, Socio-Economic, Number of children, Availability of contraception and Husband's support[2].

Socio Cultural Behavior: According to [1],[4] culture is all the behavior and results of human behavior that are organized by the behavior that must be acquired by learning, and which are all arranged in the life of the community. There are three forms of culture, namely:

1. The form of thoughts, notions, ideas, norms, regulations, and so on.
2. Human's patterned behavior activity in society.
3. Physical form, is the total physical result of human's behavioral activities.

Humans are considered cultured creatures if the human has the mind and thought that are always actual in filling his life without being tired of looking for any knowledge to develop his personality.

Family Planning Program as Social Innovation: Family Planning (KB) is one of the most basic and primary preventive health services for women. Many women must determine the difficult contraceptive choices, not only because of the limited number of method availability, individual health and female sexuality or the costs of obtaining contraception [12]. This is not only due to the limited method availability, but also by ignorance of the requirements and safety of the contraceptive method. There is no single method of contraception that is safe and effective for all clients, because each has an individual fit and suitability for the client [17].

Research Method: This research was conducted with a qualitative method, where data was collected from informants using in-depth interviews and focus group discussions (FGD)[22]. In-depth interviews were conducted for female KB acceptors (24 informants) and husbands (12 informants). The FGD was conducted twice, FGD 1 extracted information on other female family planning acceptors including those who were discontinuing contraception (12 informants). FGD 2, for sub-district KB (PLKB) service officers, family planning service providers, family planning service providers for private clinics, religious leaders and district level community (15 informants).

Results and Discussion

Result:

The Analysis of the Influence of Socio-Cultural Factor with Moderate Rational Motives on the Decision in Choosing Females' KB Contraception: According to [14], age was one of the factors that could influence a person to behave, including in choosing the type of contraception to be used. This research was not in line with the research conducted by [15]which stated that age affected couples of childbearing age in the use of contraceptives, especially MKJP.According to [14] education is needed to obtain information, therefore the higher the level of education of a person, the easier it is to receive information, therefore more knowledge is owned, and the easier the person receives information, thus someone is more receptive to the newly developed values. This research is not in line with the research conducted by [19] who said that the level of education had a considerable influence on the utilization of the KB–MKJP method.This research is in line with the research conducted by [13]find that the occupation of a woman did not have a big influence in determining the choice of a mother to become an injection KB acceptor. Thirteen informants said there was no influence on socio-economic status with the use of family planning, for various reasons, such as family planning costs were still affordable, and family planning services were provided free of charge at the Center of Health Care and Information (POSYANDU).

The Analysis of the Influence of Socio-Cultural Factors with the Strong Rational Motives on Decisions in Choosing a Female KB Contraception: The results of the research concluded that out of 24 key informants there were 23 informants who had the support of their husbands to participate in the family planning program, only 1 informant did not get husband's support, but was allowed to join the family planning program. The results of this study are also reinforced by the [15] research which states that there is an influence of husband's support with the use of contraception.

Discussion

In general, it can be concluded that husband's support greatly influences his wife in choosing to use contraception, because with the support of husband and wife, they will be more motivated and easier to run family planning programs so that family harmony can be maintained. Therefore the child's welfare is very necessary to be considered including in terms of providing a decent life for children [15]. The results of the FGD among female family planning acceptors, stakeholders and the family planning community also agreed that the number of children affected the decision of female family planning acceptors for family planning, in addition to the number of children who were sufficiently considering economic difficulties. This research is in line with the research conducted by [13] which states that the choice of contraceptive method is strongly influenced by the number of children it has. If Fertile-Age Couple has many children, it is increasingly great to choose solid contraception as an option to stop fertility.

The second variable is the availability of contraceptives. Completeness of service describes the level of service quality. The statement is in line with the

theory put forward by Green*et al*., (1980) which states that service quality is included in the factors that support the emergence of health behavior. The results of this research are also in line with the research conducted by [20] about the factors associated with the use of long-term contraceptive method in the work area of the Pancoran Mas Public Health Center in Depok, which states that there is a significant relationship between the completeness of family planning services and the use of the term contraception method Length (MKJP). According to [1] states that, as social beings, human life cannot be separated from culture, and can even be influenced by the culture where he lives. This research is in line with the research conducted by [21] which states that there is a local socio-cultural relationship with the selection of contraceptive method.

Conclusion and Suggestion

Conclusion: There are 7 (seven) social factors that characterize rational motives and there are also 8 (eight) cultural factors that characterize emotional motives. The results of the analysis formed 4 (four) main factors, namely: socio-cultural factors-1 named **"moderate rational motives"**, socio-cultural factors-2 named **"moderate emotional motives"**, socio-cultural factors-3 named **"strong rational motives"**, socio-cultural factors-4 named **"strong emotional motives"**. Socio-Cultural Factor-1 consists of 5 (five) indicators, namely: 'Age of female and husband family planning acceptors', 'Women's and husband's family planning acceptor education', 'Women's and husband's family planning acceptor's work', 'family social economic status', and 'The fatalistic attitude of female, family and community family planning acceptors in the neighborhood'. Furthermore this dimension can be called **"moderate rational motive"**.

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Ethical Clearance: We understand that, if, prior to publication, IJPHRD Journal considers that the Work should not be published due to ethical or legal reasons from Ethical Committee may decline to publish the Work.

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Epidemiology of Hypercholesterolemia among Adults in Samara City

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Abstract

Hyperchloremia is elevation of serum cholesterol level above normal (> 200 mg/dl). There are an association between cardiovascular diseases and high level of blood cholesterol. There are many risk factors of hypercholesterolemia as genetic, environmental, systematic disease as diabetes mellites and some drugs factors. A cross sectional study was conducted on adults who were attending Samara general hospital outpatients clinicduring the period from 5th February-30th April 2017. The information regarding the problem and demographic characterestics of persons was obtained according to a questionnaire and the weight, height, blood pressure, total blood cholesterol level was recorded. The results shows that the frequency of hypercholesterolemia among sample study was (54%).There is no significant association between frequency of hypercholesterolemia according to gender, age group, body mass index, family history and smoking habit but it has been reported that a significant association between high serum cholesterol and presence of hypertension, cardiac diseases and diabetes mellites.

Keywords: *Hyperchloremia, Epidemiology, Samara.*

Introduction

Hypercholesterolemia is defined as the presence of high levels of cholesterol in the blood (a form of hyperlipidemia)[1,2]. Normal serum level of cholesterol is < 200 mg/dl (< 5 mmol/l) and considered high (200 mg/dl and above)[3,4].

Cholesterol is manufactured by all animal cells. Steroid hormones and bile acid precursors are cholesterol. It is transported in blood plasma as lipoproteins which classified according to their density (very low, intermediate, low- and high-densitylipoprotein [5].

It has been documented the relation between longstanding high serum cholesterol and atherosclerosis.[6], these processes may lead to narrowing of affected arteries and may cause a clot which obstruct blood flow[7]. There is a correlation between hypercholesterolemia and coronary heart disease [8] and it has been documented increase of risk five times than those with normal level of blood cholesterol[9].

The most important risk factors of hypercholesterolemia are a combination of environmental and genetic factors. Environmental factors include obesity, diet, and stress, diabetes mellites[8]and certain medications and other systematic diseases)[6]. It has been found an association between high level of blood cholesterol and cigarette smoking,diabetes mellites and obesity[10]. There is an effect of diet on blood cholesterol but the effect varies between individuals[11].

Patients and Method

A descriptive study was conducted on adults attending outpatient clinic in Samrageneral hospital. The study started from 5th February-30th April 2017. The patients were sent for investigation of blood total cholesterol. The sample study individuals demographic information was obtained according to structured-designed questionnaire and by direct interview. The cholesterol level was considered high if it exceeds 200 mg/dl. Blood pressure,

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body weight, height, were measured in addition to obtain from patients investigation the total blood cholesterol level.

Statistical Analysis: By using SPSS 25.0 statistical software package the results were presented as the frequencies, per cent and Chi-square test was used to assess association. Statistical analysis at p-value < 0.05 was considered significant.

Results

It has been revealed that the frequency of hypercholesterolemia among study sample was 54%. Regarding the gender the frequency of hypercholesterolemia was 54% among each of male and female (Table 1).

Table (2) shows that hypercholesterolemia was more frequent among age group > 40 years (55.9%) than those among age group <40 years (48.7%) but without significant association. Table (3) shows that hypercholesterolemia was more frequent among those with body mass index (BMI > 25) (55.1%) than those with BMI <25 (51.9%) but without significant association. Table (4) shows that hypercholesterolemia was more frequent among those with hypertension (65.5%) than those without hypertension (46.7%). There is a significant association. Table (5) shows that hypercholesterolemia was more frequent among those with cardiac disease (87%) than those without cardiac disease (48%). There is a significant association.

Table (6) shows that hypercholesterolemia was more frequent among those with diabetes mellites (71.4%) than diabetes mellites those without hypertension (50%). There is a significant association.

Discussion

It has been documented in the current study that the frequency of serum hypercholesterolemia was (54%). This result is similar to result obtained by Al-Nozha *et al* in Saudi Arabia[12], and higher to that reported in Egypt (38%)[13], and by other study done by WHO (36%)[14], in Kuwait (10.6%)[15], in Oman (15.6%)[16], in Sudan (7.8%)[17], in other studies in Saudia (32%)[18], in India (33.2%)[19], other studies (37%)[20], in Korea (1.2%)[21]. The current result is lower than that reported in north Kerala in India the prevalence of hypercholesterolemia was 63.8% [22], in other studies (57%)[23], in Nigeria (62.5%)[24] and in Poland (66.4%)[25].

Regarding the gender in the sample study there are no differences in frequency of hypercholesterolemia between male and female (54%). This result is nearly to similar to that reported in Saudi Arabia[12]. It is higher to that reported in Egypt (male 39.7%, female 38.3%) but there is no significant association [13] like other studies[26,27]. Other studies in India revealed that hypercholesteremia is more frequent among female (67.6%) than male (57.6%) with a significant association[22].

In the current study the frequency of hypercholesterolemia was more frequent among age group more than 40 years (55.9%) and below age group below 40 years (48.7%) but there is no significant association (P value = 0.442). This result was nearly similar to that reported in Saudi Arabia[12], while in Egypt about (38.9%) above age 20 years and (38.7%) below 20 years without significant association[13].

In the current study the frequency of serum hypercholesterolemia is more frequent among persons with body mass index more than 25 Kg/M^2 (55.1%) than those with body mass index less than $25Kg/M^2$ (51%) but there is no significant association (P value= 0.71). This result is nearly similar to result reported by Al-Nozha et al in Saudi Arabia [12]. In India it has reported that about (69%)of those with body mass index more than $25Kg/M^2$ having hypercholesterolemia and (59%) among those with normal weight[22] while in Egypt the result of hypercholesterolemia among those with high BMI and normal BMI was (48.8%,33.9%)respectively [13]. Many studies reported that there are a significant association between obesity and hypercholesterolemia [28, 29, 30, 31].

In current study the frequency of hypercholesterolemia among patients with and without hypertension was (65.5%, 46.7% respectively) and among patients with and without cardiac disease was (87%, 48% respectively). Statistically, there is a high association (Pvalue = 0.025 for hypertension and P value = 0.001 for cardiac diseases). This result is more than that reported in Fayoum in Egypt (frequency of hypercholesterolemia among hypertensive and non-hypertensives 54.5%, 36.8% respectively) and also there is a significant association[13]. A significant relation was reported by hypercholesterolemia and high blood pressure by other studies[27,32].

There was a significant association between diabetes mellitus disease presence and hypercholesterolemia among study sample group (P = 0.04). The frequency

of hypercholesteremia in this study among diabetic and nondiabetic patients was (71.4%, 50%) respectively. This result is going with results of other studies which reveal that diabetes mellitus is one of causes of hypercholesterolemia and there are a strong association between them[8,10].

Conclusions

The current study revealed that there are a significant association between hyperchloremia and hypertension, cardiac diseases and diabetes mellites.

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Ethical Clearance: Protocol approval and the Ethical Committee Approval were achieved from the College of Medicine/Tikrit University for the protocol of the study.

Conflict of Interest: The authors declare that there are no conflicts of interest.

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Table (1): Distribution of study sample according to total blood cholesterol level and gender

			Sex		Total
			Male	Female	
Total Cholestrol	>200	Count	47	34	81
		% within Sex	54.0%	54.0%	54.0%
	<200	Count	40	29	69
		% within Sex	46.%	46.0%	46.0%
Total		Count	87	63	150
		% within Sex	100.0%	100.0%	100.0%

P value =0.995 -No significant association

Table (2): Distribution of study sample according to total blood cholesterol level and age group

			Age		Total
			<40	>40	
Total Cholestrol	>200	Count	19	62	81
		% within AGE	48.7%	55.9%	54.0%
	<200	Count	20	49	69
		% within AGE	51.3%	44.1%	46.0%
Total		Count	39	111	150
		% within AGE	100.0%	100.0%	100.0%

P value =0.442 -No significant association

Table (3): Distribution of study sample according to total blood cholesterol level and BMI

			Body Mass Index		Total
			<25 kg/M^2	>25 kg/M^2	
Total Cholestrol	>200	Count	27	54	81
		% within BMI	51.%	55.1%	54.0%
	<200	Count	25	44	69
		% within BMI	48.%	44.9%	46.0%
Total		Count	52	98	150
		% within BMI	100%.0	100.0%	100.0%

P value = 0.71 -No significant association

Table (4) Distribution of study sample according to total blood cholesterol level and hypertension

			Hypertension		Total
			Positive	Negative	
Total Cholestrol	>200	Count	38	43	81
		% within Hypertension	65.5%	46.7%	54.0%
	<200	Count	20	49	69
		% within Hypertension	34.5%	53.3%	46.0%
Total		Count	58	92	150
		% within Hypertension	100.0%	100.0%	100.0%

P value = 0.025 - Significant association

Table (5) Distribution of study sample according to total blood cholesterol level and cardiac disease

			Cardiac Disease		Total
			Positive	Negative	
Total Cholestrol	>200	Count	20	61	81
		% within Cardiac Disease	87.0%	48.0%	54.0%
	<200	Count	3	66	69
		% within Cardiac Disease	13.0%	52.0%	46.0%
Total		Count	23	127	150
		% within Cardiac Disease	100.0%	100.0%	100.0%

P value = 0.001 – High significant association

Table (6) Distribution of study sample according to total blood cholesterol level and diabetes mellites

			Diabetes Mellites		Total
			Positive	Negative	
Total Cholestrol	>200	Count	20	61	81
		% within DM	71.4%	50.0%	54.0%
	<200	Count	8	61	69
		% within DM	28.6%	50.0%	46.0%
Total		Count	28	122	150
		% within DM	100.0%	100.0%	100.0%

P value =0.04 - Significant association

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required.

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Corn Silk Based Ethosomal Gel: A New Treatment for Periodontitis in Diabetic Albino Rats a Prelimenary Study

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Abstract

Objective: Periodontitis and diabetes are related and high blood glucose level plays an important part in this correlation. Corn silk has the property of anti-hyperglycemic and anti-inflammation. The aim of this study was to determine the capability of corn silk based Ethosomal gel to reduce blood glucose level and degree of inflammation in alloxan induced rats.

Material and Method: 15wistar male rats with initial weight of 150gram were included in this study. Alloxan was used to induce diabetes and 5-0 silk ligatures to induce periodontitis. Blood glucose level was analyzed before and after induction, 3 days after administration, and 7 days after. Degree of inflammation was examined with histopathology test.

Results: Blood glucose level in F1 is unstable ($p=0.0583>p=0.05$), whilst F2 and F3 both showed stable blood glucose decrease (F2: $p=0.0086<p=0.05$; F3: $p=0.035<p=0.05$). Anti-inflammation effects best shown in F3, which has mild inflammation ($p=0.001<p=0.05$).Whereas both F1 and F2 have moderate inflammation (F1: $p=0.225>p=0.05$; F2: $p=0.423>p=0.05$).

Conclusion: Corn silk based Ethosomal gel treatment manage to reduce blood glucose level and periodontitis in alloxan induced diabetic rats.

Keywords: *Corn silk extract, Diabetes Mellitus, Ethosomal gel, Periodontitis.*

Introduction

Periodontitis is a disease caused by specific micoorganism that derived from dental plaque. These bacterian can cause progressive periodontal tissue and alveolar bone damage by inducing the formation of periodontal pocket, gingival ressesion, or both. Clinical signs of periodontitis are gingivitis, periodontal pocket, and loss of attachment.[1,2] Diabetes itself is a risk factor for gingivitis and periodontitis, and the degree of glycemic control appears to play an important part in this correlation.[3] Diabetes is a clinically and genetically heterogeneous group of metabolic disorders manifested by abnormally high levels of glucose in the blood. This hyperglycemia results from either a deficiency of insulin secretion caused pancreatic β-cell dysfunction or resistance to the action of insulin in liver and muscles, or both.[1]Diabetes itself is a risk factor for gingivitis and periodontitis, and the degree of glycemic control appears to play an important part in this correlation.[4] High glucose level in gingival crevicular fluid directly hinders fibroblast's ability to heal itself by inhibiting the attachment and spreading of cells needed for wound-healing and normal tissue turnover).[5] Abnormality in neutrophil's adherence, chemotactic, and phagocytosis has been observed in some DM patients. Neutrophil's impairment may inhibit bacterial killing in the periodontal pocket and significantly increase

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periodontal destruction. Apparently, this impairment can be subdued with better glycemic control. In conditions of sustained hyperglycemia, protein binds with glucose molecules and undergo glycationthus forms Advanced Glycation End Products (AGEs). AGEs formed on collagen increases collagen crosslinking. Due to this cross linking activities collagens formed become highly susceptible to enzymatic degradation by collagenase, which is mostly present in active form in people with diabetes. Human gingival fibroblasts also produce decreased amounts of collagen and glycosaminoglycans in the hyperglycemic state.[6] As a result of collagen crosslinking and collagen deficiency, collagen metabolism is disturbed, thus affecting wound-healing process.[7] AGEs bind with RAGE (Receptor for AGEs) on the surface of monocyte; therefore monocytes are forced to stay in one place because it limits their migration. AGE-RAGE interaction induces phenotype changes in monocyte, which increase the production of cytokine TNF, Prostaglandin E (PGE), Interleukin (IL-1β).[8] Host immune response stimulates pro-inflammatory mediators such as IL-1, TNF- α, IL-6, 1L-7 and a whole lot more PGE_2, which promotes periodontal tissue damage.[9] PGE_2 is an important mediator in periodontitis process and bone destruction also plays important part in inflammatory response regulation. PGE_2 surpresses limphocyte production, collagen synthesis by fibroblas, and bone osteoclast resorbtion.[10]

Corn silk (*Stigma maydis*) is made from stigmas, the yellowish thread like strands from the female flower of maize. It is a waste material from corn cultivation and available in abundance.[10] Throughout the world corn silk has been used as a treatment of edema as well as for cystitis, gout, kidney stones nephritis and prostatitis.[10] Corn silk contains numerous bioactive compounds such as volatile oils, steroids, alkaloids, sitosterol and stigmasterol and natural antioxidants such as flavonoids, saponins, tannins, and other phenolic compounds.[12,13] Variation in secondary metabolite compound would affect its pharmacological activities. Phytochemical contents of plant are affected by various factors such as environmental conditions, season, plant age, growth factors, and leaf maturity.[14,15,16,17]Flavonoids has the ability to inhibit α-amylase and α-glucosidase activities *in vitro*, inhibit glucose transport, prevent cytokine induced β-cell damage, and ameliorate insulin resistance peripherally.[18] Saponins can reduce blood glucose level by increasing insulin secretion, glucose uptake, and hamper glucose absorption in the small intestine. Alcaloid can decrease glucose absorption by inhibiting α-glucosidase enzyme. Tannins and phenol can interact with protein and are capable of slowing down carbohydrate catabolism. Phenolic compound also has antioxidant properties therefore it can help repair damaged β-cell hence increasing insulin secretion.[19] Aside from having anti-hyperglycemic activities, corn silk extract also has anti-inflammation, antioxidant, anti-depressant activity, diuresis, and many more.[20]

Ethosom gel is one of the Transdermal Drug Delivery System (TDDS) that can increase drug penetration despite being applied topically. The Ethosom itself is a lipid vesicle modified from liposomes. Ethosom is comprised from phospholipid, relatively high concentration alcohol (ethanol or isopropyl alcohol), and water. Ethosom vesicle sizes are varied from micrometer (μm) - 10 nanometer (nm). Ethosom needs lesser time to penetrate the skin and significantly increase transdermal drugs flux value. Ethosom also decrease the risk of GI Tract irritation due to orally administered medication.[21]

Materials and Method

Animals: Wistar strain rats weighing 150gram were purchased from local breeder in South Sulawesi. The rats were maintained at room temperature under alternating natural light/dark photoperiod and were fed twice a day with standard feed water was available *ad libitum*.

Chemicals: Alloxan was used to induce diabetes and were purchased from Tokyo Chemical Industry. Metformin used for positive control was of generic brand.

Corn silk extract preparation: Corn silk from 40 days old corns were obtained from local farmers in Jeneponto a region in South Sulawesi. The corn silk were washed and dried at room temperature (24.2 ± 1.0°C) till dried and an ethanol extraction was performed by adding 5L of ethanol 80% and 200gram dried corn silk. After 3 days of maceration process, the ethanol solvent was evaporated using rotatory evaporator.

Corn silk extract based Ethosomal gel formulation: Three corn silk based Ethosom formulas were made (refer to Table 1). Lecithin and phospatidilcolin were dispersed in heated distilled water (40°C). Corn silk extract entered lipid phase and stirred with magnetic stirrer for 5 minutes and 700rpm till it entered coloidal system. Propylene glycol and ethanol 96% were heated till 30°C and entered coloidal

system. Lechitin or phospatidilcolin, corn silk extract, propylene glycol with ethanol 96% were mixed together and homogenized with magnetic stirrer for 5 minutes and 700rpm till Ethosom suspension was formed. The suspension were cooled in room temperature then stored in the refrigerator.

After the Ethosom formulas were made, they were put in gel system (refer to table 2) and corn silk ethosomalgel were made. Carbomer 940 was dispersed in distilled water that contain methylparaben for 24 hours. After that triethanolamine was added drop by drop whilst being stirred till a clear gel mass was formed. Ethosom (Formula A, B, C) mixed with a small amount of distilled water were added to the gel base and stirred till homogenized, after that glycerin and distilled water were added to the mixture.[21]

Experimental design: 15 rats were fasted for 8h and blood glucose level was measured with blood drawn from the vein in tail. Each rat's weight was measured and then alloxan (150 mg/kg) dissolved in sterile saline were injected intraperitoneally. Three days after inducing diabetes, periodontitis was induced as well. 5-0 silk ligatureswas tied around the mandibular first incisor and tied gently to prevent damage to the periodontal tissue. The ligature was thought to facilitate local accumulation of bacteria and thereby enhance bacteria mediated inflammation. One week after alloxan was administered blood sample were drawn again from the tail vein. One week after periodontitis was induced, 14 hyperglycemic rats (the blood glucose level greater than 126 mg/dL) were selected randomly and divided into 5 groups. Metformin dissolved in water were administered orally (positive control), each formula was administered topically once a day to each specified group, and the clear gel base without corn silk extract was administered once a day (negative control group). 3 days metformin, Ethosom gel, and clear gel base was administered blood sample were drawn again for analysis. 7 days after administration, blood sample were collected for final analysis and periodontal tissue were collected for histopathology test.

The periodontal tissues were embedded in paraffin blocks after formalin fixation: After tissue fixation in formalin, tissue samples were processed in tissue processor machine. After being processed, the tissue samples then moved to embedding machine to make paraffin blocks. Paraffin blocks were then cooled down and trimmed with microtom after that moved to waterbath in 37°C. The tissue sample were then taken out using slides that were numbered. Slide then heated on hot plate at 60°C till the paraffin that surrounds the tissue melts. The section was examined after hematoxylin and eosin stainning.

Statistical Analysis: All data were analyzed using students t-test. The data represents means and standard deviations. The significant level of 5% ($P<0.05$) was used as the minimum acceptable probability for the difference between the means.

Results and Discussions

The blood glucose level of hyperglycemic rats are presented in Fig. 1. The blood glucose level for negative control kept increasing because it hasn't been given any treatment just a clear gel base as a placebo. The positive control, F2, and F3 level of blood glucose kept decreasing. In contrast with other experiments group, in F1 the blood glucose level decreased at first and starting to increase again. Eventhough, the final blood glucose level for F1 is still lower than it's blood glucose level after being induced the p value shows no significance by landing a p value at 0.0583 which is slightly bigger than p value 0.05. This indicates that F1 can not stabilize blood glucose level and has no significance in lowering blood glucose level. Metformin administered orally to positive control group shows decreasing blood glucose level but apparently has no significance statistically with p value of 0.264. Experimental groups F2 ($p=0.0086<p=0.05$) and F3 ($p=0.035<p=0.05$) both shown decrease in blood glucose level and both have significance statistically

Due to extremely large number of inflammatory cells such as leukocyte and PMN that are too many to count, the inflammation rate are shown with 3 different grades. 1 for mild, 2 for moderate and 3 for severe. As seen in fig. 2, negative control group has the highest inflammatory grade which is 3 and accompanied with cell necrosis (Fig. 3). Second highest inflammation grade is F2, in contrast to it's blood glucose level and other experiment groups. Supposedly, the degree of inflammation decreases as the blood glucose level decrease. One other important factor to note when it comes to periodontitis is that stress also affects periodontitis by altering immune system response, delayed wound healing, hormonal changes, and changes in behaviour that supports periodontitis formation.[22,23,24,25,26]

F2 control group has been observed to have high stress levels. In spite of having higher inflammation

grade than negative control, F2 has new connective tissue formation. F1 falls into moderate catagory but has no statistic significance with p value of 0.225. Only F3 has low inflamation grade and statistic significance with p value of 0.001. This imply that corn silk extract based Ethosomal gel has the ability to reduce blood glucose level and inflammation response.

Table 1. Corn Silk Based Ethosom Formula

Formula	Phospatidilcolin (F)/ Lecithin (L) (g)	Ethanol (g)	Propylene Glycol (g)	Corn Silk Extract (g)	Distilled Water
A	1 (F)	10	1	0,1	Till 50gram
B	1 (F)	10	1	0,05	
C	1 (L)	10	1	0,025	

Table 2. Corn Silk Based Ethosomal Gel Formula

Formula	Bahan					
	Corn silk extract Ethosom base	Carbomer 940	Triethanolamin	Glycerin	Methyl paraben	Water
F1	Formula A	1	2	5	0,15	Till 100gram
F2	Formula B	1	2	5	0,15	
F3	Formula C	1	2	5	0,15	

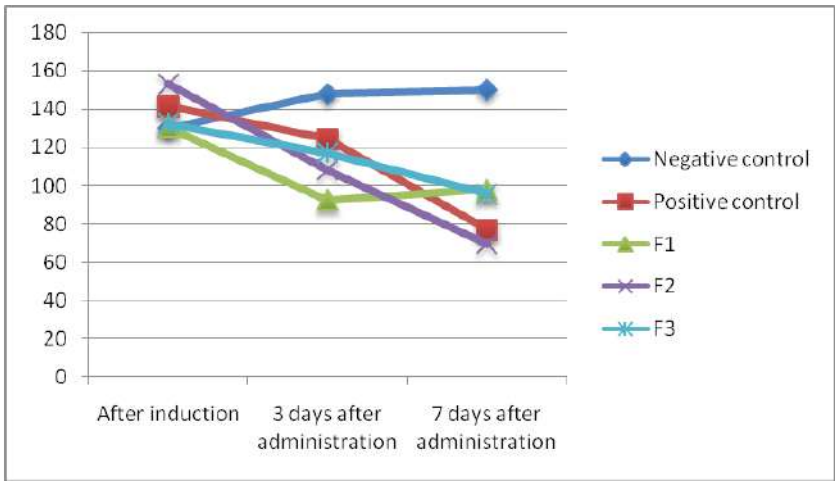

Figure 1. Blood glucose level. Values are mean

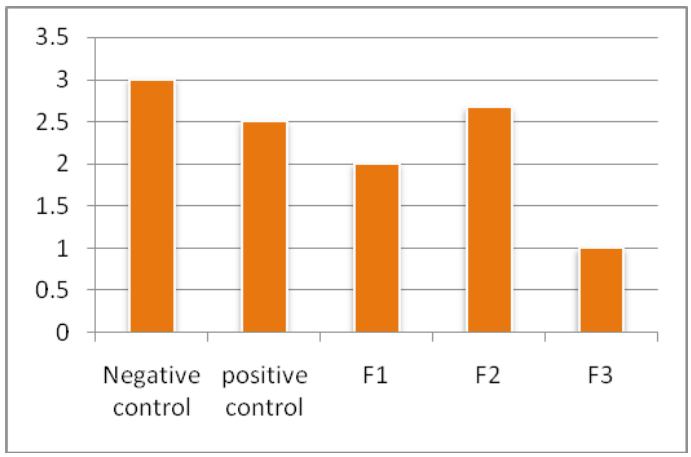

Figure 2. Degree of inflammation. Values are mean

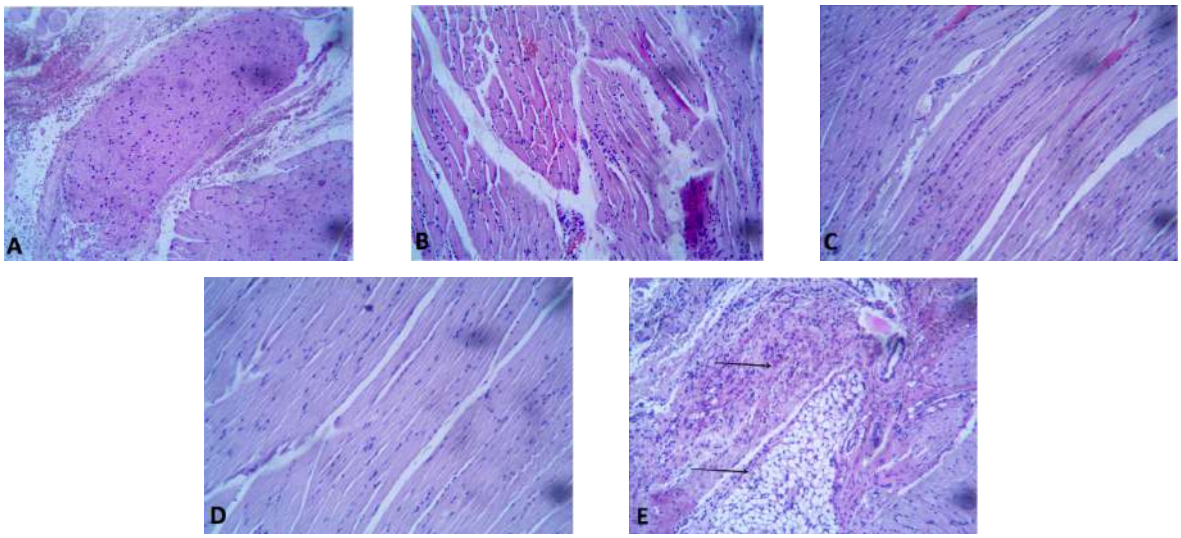

Figure 3. Inflammatory response in periodontal tissue represented by HE. (A) Negative control group showed severe inflammation response accompanied with cell necrosis (B) Moderate inflammation shown in rats administered with F1 (C) F2 administered rats shown moderate inflammation accompanied with newly formed connective tissue (D) F3 administrated rats shown mild inflammation (E) Positive control group showed severe inflammation response

Conclusion

The results showed that corn silk extract based Ethosomal gel treatment markedly reduces blood glucose level and periodontitis in alloxan induced diabetic rats. With F3, lecithin and 0.025gram corn silk extract as the formula that manages to have both anti-hyperglycemic and anti-inflammation effects.

Conflict of Interest: There is no conflict of interest in this study.

Source of Funding: Domestic government

Ethical Clearance: This study obtained a label of ethics escaped by the number: 0081PL09/KEPKFKG - RSGMUNHAS/2018 and register number UH 17120068 on Oktober 9, 2018.

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Circuit Training to Increase Cardiorespiratory Endurance in Male Basketball Players

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Abstract

In playing basketball, body fitness is important. It is closely related to biomotor abilities which consist of several components, one of which is endurance. An attack movement in a basketball game would require good cardiorespiratory endurance. Aerobic endurance is related to oxygen intake. This study aims to determine the improvement of cardiorespiratory endurance in male students who took basketball as a preferred extracurricular activity gained through circuit training. This is experimental research with one-group pretest-posttest design. The sample of this research consisted of 15 male students. Circuit training was carried out three times a week for four weeks at an exercise intensity of 65% –90% of maximum heart rate. From hypothesis testingwitha paired t-test,it was found out that P = 0.000 (0.000 < 0.05), suggesting that there was a meaningful difference. This result shows that circuit training improved cardiorespiratory endurance.

Keywords: *Circuit training, cardiorespiratory endurance, male basketball players.*

Introduction

Basketball games are considered to be one of the most dynamic and flexible sports which require high levels of physical fitness[1]. Physical relations are associated with biomotor abilities because biomotor abilities are the abilities to measure human performance[2]. One of these biomotor components greatly affects a person's endurance, namely resilience. Resilience is the ability of the heart, lung, and blood vessels to work optimally when carrying out activities for a long time without experiencing interference[3]. Resilience can be grouped into anaerobic resistance and aerobic resistance[4],[5].

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The training session applied by the coach was directed more to technical training and games. This affected the physical strength of poorly trained players[1],[6].

Cardiorespiratory endurance can be increased by a variety of training techniques, one of which is circuit training[1],[7]. Circuit training is a combination of several types of exercises carried out in several training posts [2]. At each training post, an athlete will perform a predetermined type of exercise[8]. One circuit training set is said to be complete if an athlete has completed training in all training posts according to the prescribed dose. The movements included in this circuit training are as follows: push-ups, sit-ups, vertical jumps, abdominal curls, back extensions, astride jumping over benches, pull-ups, bench stepping, burpe, shuttle run, thrust squats, side bend, skipping, and running on the spot[9].

Material and Method

Participants: The population in this study was all male students who took extracurricular activities at a middle school in Denpasar, Bali. The sample in

this study was male students who took basketball as a preferred extracurricular activity. The sample used had to meet the following criteria: the participants were male middle school students who took basketball as an extracurricular activity, were aged 13–14 years, had low cardiorespiratory endurance of < 35 (poor), and did not take part in any cardiorespiratory resistance training program other than circuit training during the study. After each of these posts the students were given a break period of 15 to 20 seconds before proceeding to the next post. After completing one circuit, the students were also given a break period of 15 to 20 seconds.

Circuit Training Measures: In this study, some interviews and observations were carried out, and information related to age and some complaints experienced was generated. This would affect the daily physical activity and the training process and would let the researchers know whether the respondents observed were not too large. Several circuit training posts consisting of running on the spot, shuttle run, skipping, squats, push-ups, sit-ups for each set were established. This exercise was performed in 2 repetitions (sets) with a break time of 15–20 seconds between stages and between circuits.

a. Stage 1: Running on the spot. This training post lasted for 20 seconds.

b. Stage 2: Shuttle run. This training post lasted for 30 seconds (the students run back and forth and touched the predetermined boundary line).

c. Stage 3: Skipping or jumping rope. This training post lasted for 30 seconds (the students made a leap using the rope provided).

d. Stage 4: Squat. This training post lasted for 30 seconds (the students stood then bent both knees to a half squatting position and repeated continuously for a specified time period).

e. Stage 5: Push-up. This training post lasted for 30 seconds.

f. Stage 6: Sit-up. This training post lasted for 30 seconds.

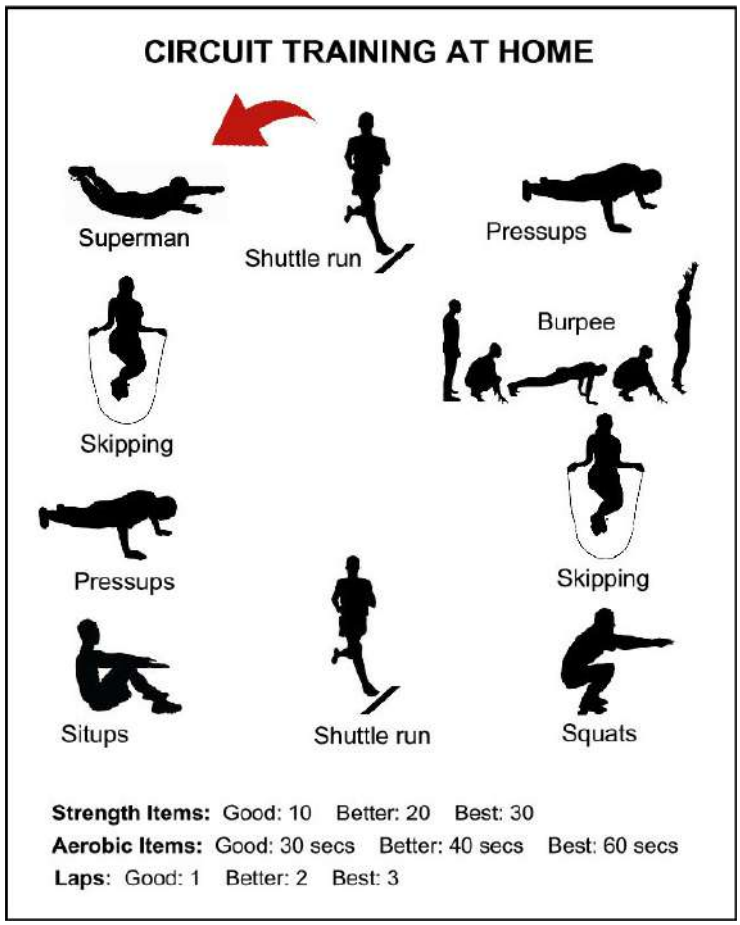

Fig. 1: Circuit trainning[9]

Statistical Analyses: This study used an experimental method with one-group pretest-post design. The data in the study were analyzed using SPSS. The analysis was conducted to describe the results of the research in the field without having to manipulate the facts. The data from the group were subjected to a Shapiro-Wilk test at a significance level of 0.05. It was used to examine the average chest expansion before and after treatment in each group.

Finding and Results: Table 1 shows the number of respondents based on age:10 respondents (66.7%) were 13 years old, and the remaining 5 respondents (33.3%) were 14 years old.

Table 1: Age distribution of respondents

No	Age	Frequency	Percentage (%)
1	13	10	66,7
2	14	5	33,3
	Total	**15**	**100%**

Table 2 shows the number of respondents based on the VO_{2max} values obtained from the Balke test before the circuit training was performed: 5 respondents (33.3%) obtained values of < 35 and fell into the very poor category, 8 respondents (53.3%) obtained values of 35–37 and fell into the poor category, and 2 other respondents (13.3%) obtained values of 38–44 and fell into the fair category.

Table 2: Distribution of VO2 max values through Balke Test before being given Circuit Training

The VO2 max value in the balke test	Total		
	Category	F	Percentage (%)
< 35	Very poor	5	33,3
35 – 37	Poor	8	53,3
38 – 44	Fair	2	13,3
Total		**15**	**100%**

Table 3 shows the number of respondents based on the VO_{2max} values from the Balke test after the circuit training was performed: 1 respondent (6.7%) obtained a value of < 35 and fell into the very poor category, 6 respondents (40.0%) obtained values of 35–37 and fell into the poor category, and 8 respondents (53.3%) obtained values of 38–44 and fell into the fair category.

Table 3: Distribution of VO2 max values through Balke Test after being given Circuit Training

VO2 max value	Total		
	Category	F	Percentage (%)
< 35	Very poor	1	6,7
35 – 37	Poor	6	40,0
38 – 44	Fair	8	53,3
Total		**15**	**100%**

Table 4 shows that the average VO_{2max} value obtained by a sample of 15 from the Balke test before the circuit training was performed was 35.68, the median was 36.2, the lowest value was 31.60, and the highest value was 39.60. Meanwhile, from the Balke test after the circuit training was performed to the same sample, the average VO_{2max} value was 38, the median was 38.5, the lowest value was 33.30, and the highest value was 44.

Table 4: Results of Measurement The average VO2 max value through the balke pre-test and post-test.

Variable		Mean	Median	Min	Max	%
Balke test	Pre-test	35,68	36,20	31,60	39,60	6,5%
	Post-test	38,00	38,50	33,30	44,00	

Table 5 shows the results of the normality test using the Shapiro-Wilk test. The pre-test VO_{2max} was 0.980. Because 0.980 > 0.05, the pre-test data were normally distributed. Meanwhile, the post-test VO_{2max} was 0.848. Because 0.848 > 0.05, the post-test data were normally distributed.

Table 5: Data Normality Test Results Measurement of VO2 max values through the balke test

Variable		Statistics	Sig,	Interpretation
Balke test	Pre-test	0,982	0,980	Normal
	Post-test	0,969	0,848	Normal

Table 6 shows that the paired t-test comparing the pre-test and post-test VO_{2max} values obtained from the Balke tests conducted on the sample yielded a significant result of 0.000 (0.000 < 0.05), indicating that there was a change in cardiorespiratory endurance after circuit training was performed.

Table 6: Results of paired t-test analysis

Results		Df	Sig	Information
Balke test	Pre-test	14	0,000	There are significant differences
	Post-test			

Discussion

Cardiorespiratory endurance in males aged 13–14 (adolescents) can increase if training is applied in accordance with a stipulated dosage or training load[10], [11].Age affects all components of physical fitness, and VO_{2max} plays an important role in respiratory fitness. VO_{2max} of children aged 8–16 years shows a progressive and linear increase in peak aerobic ability. Thus, it can be increased by applying active sports such as circuit training[12], [13], [14]. However, circuit training produces different levels of VO_{2max}, causingnon-optimal VO_{2max}achievement[6], [15]. Circuit training is designed to develop cardiorespiratory fitness, cardiovascular endurance, flexibility, strength, and muscle endurance [16]. This exercise has a number of advantages: it can be performed in a short time period;it can be applied to one person or a group of persons; and it does not require any complicated equipment [2]. Circuit training is designed to stimulate the cardiorespiratory organs, and, as a result, the resistance aspect is emphasized [17].

Some research studies reveal that male basketball players aged 10–12 years saw an increase of VO_{2max} after carrying out circuit training exercises for 6 weeks as well as average initial score and average final score by 7.68 ml/kg BW/minute (20.68%) [18],[3]. According to the American College of Sports Medicine in 2006, the target heart rate rangeone should achieve when conducting a circuit training exercise to experience cardiorespiratory benefits is 65% –90% of the maximum heart rate [15],[21]. This is in accordance with the results of the research conducted—that is,the dose used should be based on the size of the maximum heart rate to achieve changes in the cardiorespiratory aspect [19]. Recent studies related to exercises that have an effect on cardiorespiratory function have shown that breathing exercises are able to increase the amount of O_2 intake, for instance, chest expansion, with a p value of <0.05[20], [22]. Thus, the exercise also has an impact on the aerobic capacity of both sick patients and healthy people.

The results of this study show an increase in the cardiorespiratory endurance of male students taking basketball as an extracurricular activity based on the VO_{2max}values obtained from a Balke test (p= 0.000). The students were given circuit training 3 times a week for 4 weeks of meetings with a training load of 65% –90% of the maximum heart rate. Each circuit training treatment consisted of 2 sets of exercises, each of which consisted of 6 types of exercises that had to be carried out in each training post provided. Based on the VO_{2max} values before the circuit training was given to the sample, 20% of the respondents fell into the very poor category, 66.7% to the poor category, and 13.3% to the fair category. The 6 types of exercises were running on the spot, shuttle run, skipping, squats, push-ups, and sit-ups. This study's results are supported by previous research that was conducted on middle school students, which reveals that 6-week circuit training exercises on leg muscle strength could increase VO_{2max}[18], [23], [8].

The main limitation of our study is that we have yet to find anyother types of training comparative to circuit training for increasing the cardiorespiratory fitness of middle-school basketball players, thus we are in need of literature related to other types of aeorbic training. Therefore, more precisely, we recommend exercise to overcome the decline in cardiorespiratory fitness, for example, a decrease in the functional aerobic capacity.

Conclusions

From the observations conducted three times a week for four weeks, it was found that the provision of circuit training could increase the cardiorespiratory endurance of male students who took basketball as an extracurricular activity. However, in order to gain further insights regarding the improvement of cardiorespiratory fitness of long-term male basketball players, the sample size should be greater because the fitness level of each man may vary.

Conflict of Interest: The authors declare that there is no conflict of interest related to this study.

Source of Funding: The authors declare that there is no source of funding from anyone.

Ethical clearance: The experiment was approved taken from by the Research Ethics Committee of Medical Faculty of Udayana University/Sanglah Hospital.

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Relationship between Self-Care for Fluid Limitation and Interdialytic Weight Gain among Patients with Hemodialysis at Ratu Zalecha Hospital, Martapura

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Abstract

Chronic kidney failure is progressive and irreversible which caused metabolism disorder as well as electrolyte imbalance. This condition makes the patients to conduct hemodialysis. Patients with hemodialysis must have the ability to do self-care for fluid limitation management. Self-care deficit in managing fluids can cause interdialytic weight gain. The aim of this study was to measure the correlation between self-care for fluid limitation and interdialytic weight gain among chronic kidney disease patients with hemodialysis in Ratu Zalecha hospital Martapura. This study used cross-sectional study, total sampling and the final sample was 50 respondents. Data were collected in 2018. We used Spearman Rank Correlation to analyze the data. The result showed that there was a correlation of self-care for fluid limitation and interdialytic weight gain among patients with hemodialysis in Ratu Zalecha Hospital Martapura (p-value< 0,000; r= 0,589). The capability of self-care for fluid limitation and increase self-confidence among patient with hemodialysis to prevent interdialytic weight gain is needed.

Keywords: *Self-care, Fluid limitation, Interdialytic weight gain, hemodialysis.*

Introduction

Kidney has an important role in the human body to maintain fluid volume and distribution [(1).] Kidney failure requirements long treatment [(1)]. More than 500 million people had Chronic kidney failure [(2)]and only 0.1% of kidney failure was detected [(3)]. 2,622,000 people with kidney failure conducted end-stage renal disease (ESRD), and 77% undergo hemodialysis treatment [(3)]. *National Center For Chronic Disease Prevention and Health Promotion* (2014) noted that the prevalence of chronic kidney failure was increased [(4)].

Chronic kidney failure is progressive and irreversible. The urea creatinine will increase as the body inability to maintenance metabolism and keep fluid and electrolyte balance[(5)]. Additionally, kidney failure caused endocrine disorder and metabolic disorder, so it needs hemodialysis or kidney transplantation [(5)]. Hemodialysis is needed to remove metabolic residual from the blood such as water, sodium, potassium, hydrogen, urea, creatinine, uric acid, and others substance through semi-permeable membranes [(6)]. Hemodialysis also assists to maintain fluid balance, but the patients have to control their fluid regularly.

Patients with hemodialysis need to be trained to calculate fluid balance within 24 hours so they can control the fluid based on their needs. The fluid restriction will prevent fluid excess, because fluid excess can cause disruption of function in other organs, such as lung and cardio [(7)]. Another consequence is interdialytic weight gain, edema, wet rheumatism in the pulmonary, swollen eyelids and shortness of breath [(5)].

Patient with hemodialysis is required to do self-care independently, it refers to self-care. Self-care is an individual effort to fulfill their needs by optimizing

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intellectual abilities, behavior and utilizing the environment[8]. Self-care can be achieved by applying Dorothea E. Orem's nursing self-care theory. According to Orem's theory, every individual with a certain age and condition has the ability to treat, protect, control, minimize and maintain the body to get healthy and well-being as well as optimal life both healthy and sick, or recovering from illness [5].

Self-care deficit in managing fluids can cause an increase in body weight between two dialysis times due to increased body fluid volume, it refers to interdialytic weight gain [9]. Interdialytic weight gain is one of the complications in patients with chronic renal failure who undergo hemodialysis caused by the inability of the renal excretion function. Increasing the value of the interdialytic weight gain will cause a negative effect such as hypotension, muscle cramps, hypertension, shortness of breath, nausea vomiting [10], also cause hypertension, peripheral edema, pulmonary edema, and increase the risk of dilatation and cardiac hypertrophy [7]. The problem in this study was to measure the relationship between self-care of fluid limitation and interdialityc weight gain among patients with chronic renal failure and hemodialysis in RatuZalecha Hospital Martapura.

Method

Participants and Settings: All of the procedures of this study got permission from Institutional review board in one of University in Indonesia. This study used cross-sectional design to analyze the correlation between self-care for fluid limitation and Interdialytic Weight Gain. The Dependent variable was self-care for fluid limitation and the independent variable was Interdialytic Weight Gain.

Data were collected from patient with hemodialysis in RatuZalecha Hospital Martapura, South Kalimantan, Indonesia, and used total sampling. We collected the data from Januari until February 2018. Total patients with hemodialysis in this hospital were 81. It produced 60% respond rate, so the final sample was 50 respondents.

Instruments: We used self-report questionnaires to collect the data.

Self-care for fluid limitation: We developed this questionnaire based on self –care concept from Orem theory (11, 12). It had 3 dimensions self-care maintenance, self-care management, and self-care confidence with total of 20 items. Self-care maintenance refers to knowledge regarding decision–making with true-false question (7 items), self-care management refers to behavior regarding health maintenance (7 items), with Likert scale (always-never), and self-care confidence regarding self-efficacy (6 items) with Likert scale (strongly disagree-strongly agree). The score between 51-80 means high score in self-care, and score between 20-50 means low score in self-care. This questionnaire had good convergent validity (r> 0.2) and adequate internal consistency with cronbach alpha= 0.839.

Interdialytic weight gain (IDWG): This is an observational instrument and measure body weight before hemodialysis, body weight after hemodialysis. We used Nerbass theory to determine the different bodyweight as well as the percentage of body weight (13). If the percentage of bodyweight < 5% refer to normal.

Statistical analysis: We used SPSS for windows to analyze the data (p value of < 0.05 are considered to describe statistically significant differences). Descriptive statistics (frequency and percentage) were used to calculate all variables. A spearman correlation was used to explore the relationship between self-care for fluid limitation and Interdialytic Weight Gain. Regarding response rate we used the recommendation from the previous study, that was 60% response rate [14].

Findings:

Characteristic of Respondents: Table 1 shows the characteristic of participants, included in this study: age, gender, and length of hemodialysis. Regarding age, 34% of participants were 45-55 and 56 -65 years old, the proportion of male was 54% and female was 46%. Length of hemodialysis showed that 54% of participants undergo hemodialysis around 12-24 months and 40% of participants undergo hemodialysis > 24 months.

Table 1. Demographic characteristic of participants

Characteristic	N	%
Total = 50		
Age (Years)		
18-40	3	6
41-45	8	16
46-55	17	34
56-65	17	34
>65	5	10

Characteristic	N	%
Gender		
Male	27	54
Female	23	46
Length of Hemodialysis		
<12 months	3	6
12 – 24 months	27	54
>24months	20	40

Descriptive statistics among variables: Table 2 shows 58% participants had good self-care for fluid limitation and 42% had low self-care for fluid limitation. In term of Interdialytic Weight Gain, 58% participants had normal Interdialytic Weight Gain and 42% participants had abnormal Interdialytic Weight Gain.

Table 2. Statistical Description of variables

Variables	N	%
Total = 50		
Self-care for fluid limitation		
High	29	58
Low	21	42
Interdialytic Weight Gain		
Normal	29	58
Abnormal	21	42

Correlation among Study Variables: Table 3 shows significant correlation between self-care for fluid limit and Interdialytic Weight Gain with moderate relationship (r = 0.589, *p* value < 0.01)

Table 3. Relationship between self-care for fluid limit and Interdialytic Weight Gain

	Interdialytic Weight Gain
Self-care for fluid limit	0.589**

**p value < 0.01

Discussion

Self-care for fluid limitation among patients with hemodialysis in Ratu Zalecha Hospital Martapura: Patients with hemodialysis generally have complex problems and require to fulfill their needs. One of their needs was related with ability to care themselves. Patients with hemodialysis must have ability to maintain their fluid intake to achieve optimum quality of life. Self-care in this study used Orem theory[11,12,15]. Based on this study, 58% of respondents had good self-care for fluid limitation (table 2). Most respondents showed higher self-care maintenance (knowledge) followed by self-care confidence (self-esteem) and self-care management (behavior). Previous study noted that quality of life could be achieved by increasing self-care[3].

This study also showed most of the respondents had low self-care management to manage the fluid intake. The patients did not calculate the fluid intake and urine output a day. They consume 2-3 glasses of water in a day, with urine output 500 ml/24 hours and also manage thirst by brush their teeth and gargling. However, they did not know that they must restrict salty food that induces thirstily. Previous study mentioned about the obstacle of self-care management among patients with hemodialysis was internal and external factors. Internal factors were low of motivation to diet and fluid restriction during activity. External factor was cost of hemodialysis [16]. Fluid restriction is needed to give comfort to patients before and after conducting hemodialysis [5].

Interdialytic weight gain among patients with hemodialysis in Ratu Zalecha Hospital Martapura: Interdialytic weight gain is related to the patient's fluid restriction. Fluid restriction is one of the treatments for end-stage renal disease (ESRD) to prevent worse conditions. The amount of fluid was determined for a day, and it depends on kidney function, the patient's edema and urine output [17]. This study showed that 58% participants increased of body weight and it was normal range. 42% of participants were an abnormal range (table 2). Fluid intake among patients with chronic renal failure related to Interdialytic weight gain. This study was similar to previous study [17]. We assumed that Interdialytic weight gain due to thirsty condition among participants, it was similar to Black and Hawks theory[18].

Increased interdialytic weight gain exceeding 5% of dry weight can cause several of complications such as hypertension, interdialytic hypotension, left heart failure, ascites, pleural effusion, congestive heart failure, and also can lead to mortality. Many factors contribute to interdialytic weight gain, such as internal factors (thirst, stress, and self-efficacy) also external factors such as family support and fluid intake [19].

Relationship between self-care for fluid limitation and Interdialytic weight gain among patients with hemodialysis in RSU Ratu Zalecha Martapura: In this study showed 82.8% respondents had high self-care for fluid restriction experienced an increase in normal

interdialytic weight gain and the remain was respondents with low self-care for fluid restriction experienced an increase in abnormal interdialytic weight gain. This study also showed that self-care for fluid restriction was statistically significant with interdialytic weight gain (table 3) with moderate correlation (r = 0.589). This study was similar previous study about significant relationship between fluid intake and interdialytic weight gain[17].

Limitation: This study had some limitation. This study used cross-sectional study and relatively small sample size. Therefore, the results may be generalized carefully. Further study is needed to increase self-care for fluid limitation among patients with hemodialysis to prevent Interdialytic weight gain.

Conclusion

Besides the limitations, this study produced enough response rate. We are confident that self-care for fluid limitation related to interdialytic weight gain. This study suggests evidence to increase self-care for fluid limitation to prevent Interdialytic weight gain.

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Conflict of Interests: The authors declare no potential conflict of interests.

Ethical Clearance: All procedure of this study was granted IRB from Health Research Ethics Committee, PoliteknikKesehatan (Poltekkes) Banjarmasin, South Kalimantan, Indonesia, number 158/KEPK-PKB/2018.

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Effect of Preoperative Biofeedback on Anal Continence After Fistula in Ano Surgery

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Abstract

Objective: The aim of the present prospective study was to evaluate the role of preoperative prophylactic biofeedback therapy on the anorectal continence of patients with high anal fistula who will be subjected to fistulectomy operation.

Method: This was a randomized control study which included 40 patients who presented to the Out Patient Department (OPD) of Kasr-al ainy Hospitals, from March 2015 to September 2016. Allpatients (40) have been presented with high complex anal fistulae. They were divided into two equal groups; group (A) has twenty patients who had undergone prophylactic preoperative anorectal biofeedback and group (B) has the other twenty patients who didn`t receive the prophylactic preoperative anorectal biofeedback therapy. For group (A) patients, six sessions of biofeedback were done two weeks. All patients were assessed postoperatively (0, 3 and 6 months) for continence by Cleveland Clinic Score for incontinence.

Results: Among these forty patients only four (10%) had developed anal incontinence with variable degrees (two of them gas incontinence and another two developed frank stool incontinence), these four patients belong to the group (B), on the other hand, none of group (A) patients had developed incontinence.

Conclusion: In conclusion, we can rely on preoperative prophylactic biofeedback has an important role to minimize incontinence post high anal fistula surgery.

Keywords: *Fistula in ano, Fecal Incontinence, Biofeedback.*

Introduction

Surgery of perianal fistulas remains a challenge because of potential sequences including fecal incontinence (FI) that may impair quality of life. [1]

Reported incidences of incontinence following fistulas surgery range from 5% to 60%. Sphincter preserving approaches such as core fistulectomy or mucosal advancement flap are recommended for high complex fistulas as better approaches to preserve continence.[2-4]

About 70% of the resting tone is achieved by internal anal sphincter (IAS). This is supported by the finding lateral internal sphincterotomy could be complicated by fecal incontinence.[5]

The external anal sphincter (EAS), similar to the IAS, is in a state of tonic contraction even at rest and the activity is reflexly raised when intra-abdominal pressure is increased e.g. when coughing, laughing or lifting. Activity is maximally raised when the EAS is contracted voluntarily but contraction.[6]

Both American College of Gastroenterology and the American Gastroenterological Association

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recommend anorectal biofeedback for the treatment of FI. Biofeedback treatment protocols for FI aim to strengthen pelvic floor muscles, to increasethe ability to sense rectal filling and to teach patients to perceive and react even if the rectum is dilated slightly.[7-9]

Aim of work: The aim of this article was to describe a standardized biofeedback anal exercises protocol as aprophylactic measure prior to complex anal fistulas surgery to minimize the incidence of postoperative fecal incontinence**.**

Material and Method

Patients: Our study included **40** patients who came to the Out-Patient Department (OPD) of Kasr-el Ainy Hospital, from **March 2015** to **September 2016**.

After agreement from the Scientific and Ethical Committee of General Surgery Department and Faculty of Medicine Cairo University, the procedure and the study were explained to all individuals participating in the study and informed written consents were taken.

Forty patients who were candidates for high anal fistulas surgical treatment were randomized into two equal groups (A and B) using closed envelope. Neither patients nor physicians were blinded to the group assignment because of the nature of the study. Group (A) included 20 patients who had preoperative biofeedback program while group (B) included 20 patients that were not undergone biofeedback program. Patients' selection was done using the closed envelope method.

Patients, not fit for surgery didn't accept treatment modality, at extreme ages, and/or those with low anal fistulas were excluded from the study

Method

Pre-operative: All patients were underwent proper history taking (age, presentation, occupation, presence of previous abscess, contributing factors, continence assessment by Cleveland Clinic Score for incontinence and previous anal surgeries) and full general and local examination (P/R examination) to determine: External fistulous opening, Internal fistulous opening,primary, secondary tract, sphincter tone, scars and presence of abscess cavity.

Anatomical assessment of the fistula tract, its relation to the anal canal and muscular complex were studied by magnetic resonant imaging (MRI) and/or Endoanal Ultrasonography (EUS).

After the agreement of the scientific and ethical committee of the general surgery department, the procedure and the study were explained for all individuals participating in the study and all of them consented for agreement.

Biofeedback protocol: The biofeedback protocol was explained in details to patients in group (A). It was done in the colorectal unit with the subject in the left lateral position a multi-lumen catheter was placed in the rectum with 8 side holes with varying distances from the anal verge. These were perfused with water and connected to water filled transducers. A 5 cm latex balloon was attached to the catheter and linked to an air filled transducer. Catheter used: with 8 side holes 3,4,5,6,7,8,9 and 10 cm from the balloon and at angles 0, 45, 90,135,180,225,270 and 315 respectively. Recordings were made on a computer using the machine software to be printed when needed.

Six sessions were performed preoperatively each of which lasting 20 -30 minutes, the sessions are performed every other day with average three sessions per week. First sensation: the balloon of the catheter is inflated until the first sensation is reached at which the patient is asked to contract his sphincters; this is done to improve sensation and coordination. Challenge pressure, the patient is asked to pass the obstacle over a bar (representing the challenge pressure) by maximum squeeze. The muscle response measured by pressure transducers is translated into a visual display so that the patient receives immediate feedback regarding the strength and duration of pelvic floor muscle contraction. Challenge time, during which the patient squeezed. Resting time, during which the patient rested. Challenge pressure, challenge time and resting time could be adjusted through the program before starting the session

Operation: For all patients general anesthesia without muscle relaxant was used. Patients were operated in lithotomy position. They were received prophylactic antibiotic.

Core fistulectomy was done to all the patients. Its principle was to remove the chronic, epithelialized tract to allow healing by secondary intention of healthier tissue. Dissection was typically carried out from the external opening up to the internal fistulous opening.

Postoperative care: The patients started oral fluids

same day of procedure intake advanced gradually as patient tolerating feeding. Analgesia (usually IV or IM nonsteroidal anti-inflamatory) started immediately postoperative.

Patients were discharged 24 hours postoperative with instruction for frequent dressing. Early assessment for anorectal continence was carried using Cleveland Clinic incontinence score (table 1)[10].

Table (1): Cleveland Clinic continence score

The Wexner score					
Type of Incontinence	**Frequency**				
	Never	**Rarely**	**Sometimes**	**Usually**	**Always**
Solid	0	1	2	3	4
Liquid	0	1	2	3	4
Gas	0	1	2	3	4
Wears pads	0	1	2	3	4
Lifestyle alteration	0	1	2	3	4

Never, 0; rarely, <1/month; sometimes, <1/week, 1/month; usually, <1/day, 1/week; always, 1/day. 0, perfect; 20, complete incontinence.

The patients were advised for follow up in outpatient clinic 7-14 days to assess the wound and early postoperative complications. 6 months later, anorectal continence was reassessed after complete wound healing.

Findings: Both groups were matched regarding the age and gender. The mean age for group (A) was 41.35 while that for group (B) was 39.5.

In group A, there were 8 (40%) with extrasphincteric fistulas, 4 (20%) with suprasphincteric fistulas and 8 (40%) with high transphincteric fistulas while in group B, there were 5 (25%) with extrasphincteric fistulas, 6 (30%) with suprasphincteric fistulas and 9 (45%) with high transphincteric fistulas.

There were 4(20%) patients with recurrent fistulas in group A and 3 (15%) in group B.

Four patients in each group had associated abscess collections that had been drained during fistula surgery.

According to Cleveland Clinic incontinence score for postoperative follow up, 4 patients developed incontinence in group B while all patients in group A were fully continents postoperatively (p = 0.038).

Table (2): Analytical results of the patients with high anal fistulas without preoperative biofeedback who had developed incontinence.

Fistula type	Preoperative Wexner score	Postoperative Wexner score
Extrasphincteric with abscess formation	0	8
Suprasphinctericfistulas with abscess	0	20
Suprasphincteric fistulas with abscess	0	20
Suprashincteric	0	4

Discussion

The fecal incontinence is a very frequent pathology, the frequency considered in the general population being 2-3%, although the studies of prevalence in the general population show a great variability[11]. Biofeedback training has been regarded as the conservative therapy of choice for fecal incontinence secondary to a variety of medical and surgical disorders in all age groups[12].

The preoperative biofeedback and pelvic exercises improve urinary control and decrease severity of urine incontinence following radical prostatectomy[13].

This was a randomized control study, which included forty patients who presented to the outpatient clinic of the colorectal unit in Kasr Alainy hospital in the period between from March 2015 to September 2016for colorectal surgery.

The purpose of this study was to assess anorectal biofeedback as a prophylactic measure for fecal incontinence after fistulectomy surgery for patients with complex fistulas.

In 2003, Fernandez et al. studied the effect of anorectal biofeedback on a total of 145 patients with anal incontinence (118 female and 27 male) Four weeks following completion of the sessions, 59 patients (76%) had improved significantly, 13 (17%) had improved slightly and 6 (8%) had not changed[14].

In 2007, Byrne et al. studied 513 patients, 385 (75 percent) completed the treatment program. In those completed the treatment program maximum anal sphincter pressure increased by a mean 12 mmHg (14 percent; from 90 to 102 mmHg)[15].

In 2004, Kairaluoma et al. studied biofeedback therapy in treating 22 patients with anal incontinence; 21 female and one male, with a median age of 57 (range 27–84) years. In this study manometry results suggested that the external sphincter function is improved by biofeedback therapy. However, there is no effect on resting pressure and internal sphincter function[16].

In 2003, Kienle et al. studied a consecutive patient series (N = 70) with anal sphincter deficiency and compare the efficacy of biofeedback and electrostimulation as conservative treatment options. Forty patients were treated by biofeedback therapy; Patients were not specifically selected for one or the other treatment. Resting and squeeze pressure increased significantly after biofeedback training ($P < 0.05$ and < 0.001)[17].

In 1994, Keck et al. studied fifteen patients (13 women and 2 men) with incontinence underwent a mean of three (range, 1–7) biofeedback sessions. The cause was obstetric (four patients), postsurgical (five patients), and idiopathic (six patients). Total resolution of symptoms was reported in four patients, favourable improvement in four patients and some improvement in three patients. Manometric measurements showed a mean increase of 15.3 mmHg in resting pressure and 35.7 mmHg in squeezing pressure after biofeedback[18].

In 2006, Dobben et al. studied 266 patients (91% female) and observed that the improvement in incontinence with the use of biofeedback was not associated with results in tests including anorectal manometry[19].

Conclusion

In our study twenty patients with high anal fistulas had received prophylactic biofeedback therapy with mean age of 41.35 years, all of them were completely continent postoperatively; another twenty patients with high anal fistulae had not received prophylactic preoperative biofeedback with mean age of 39.45 years, among them four patients had developed fecal incontinence with varying degrees (two patients had developed gas incontinence and another two had developed complete incontinence), so it had been found that preoperative prophylactic biofeedback has an important role to prevent or minimize incontinence post high anal fistula surgery (with P value of 0.038 when comparing both groups using the Wexner score) as it enhances the contraction capacity of the external sphincter muscles and has a role to teach the patients to perceive and react even the rectum is slightly dilated.

Preoperative prophylactic anorectal biofeedback reduces the incidence on anorectal incontinence after anal operations for high anal fistulae.

The use of biofeedback has shown that autonomic functions can be conditioned by training the mind to control them.

Biofeedback enhances the contraction capacity of the external sphincter muscles.

Biofeedback teaches the patient to perceive and react even if the rectum is slightly distended.

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Conflict of Interest: No

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Relation between Human Epididymis Protein 4 and Endometrial Pathology in Women with Postmenopausal Bleeding

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Abstract

Objective: To evaluate the value of human epididymis protein 4 (HE4) in predicting endometrial pathology in women with postmenopausal bleeding (PMB).

Method: A cohort study included 100 women with PMB. Women with endometrial thickness (ET) >5mm were subjected to hysteroscopic guided fractional curettage (FC) followed by total abdominal hysterectomy and bilateral salpingo-oophorectomy with or without pelvic lymphadenectomy.

After exclusion of 10 patients, the value of serum HE4 was tested in 90 patients for the ability to predict endometrial pathology based on hysterectomy specimen.

Results: Level of HE4 showed a significant difference among women with different endometrial pathologies. HE4 showed a significant positive correlation with the severity of the endometrial lesion, with mean values of 38.33±27 pmol/L for atrophic endometrium (11 cases), 51.26±28.59 pmol/L for simple endometrial hyperplasia (SEH, 51 cases), 148.4±67.34 pmol/L for atypical endometrial hyperplasia (AEH, 16 cases) and 390.9±351.72 pmol/L for endometrial carcinoma (EC,12 cases) Using the cut-off value of 69.5 pmol/L for preoperative HE4 yielded a sensitivity of 75% and a specificity of 88.5% in prediction of EC.

Conclusion: HE4 can predict endometrial pathology in women with PMB with a high specificity and a fair sensitivity.

Keywords: *Human epididymis protien4 (HE4); postmenopausal bleeding; endometrial carcinoma; endometrial pathology.*

Introduction

Endometrial carcinoma accounts for 20% to 30% of malignant tumors in the female reproductive system. As a consequence to increased obesity, hypertension, diabetes, and prolonged life expectancy, the incidence and mortality of endometrial carcinoma have risen lately, with a tendency for onset at a younger age [1]. The prognosis is closely related to the disease stage. If the diagnosis is during stage I, then the survival rate is about 90% [2].

There are no specific tumor markers for endometrial carcinoma. CA-125 was detected in 1983 by Bast et al.[3] as the epithelial ovarian carcinoma antigen. However, CA-125 is less effective in the diagnosis of EC compared with the diagnosis of other gynecological carcinomas. CA-125 can only produce obvious effect in diagnosing some common tumors in advanced stage [4] .

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HE4 biomarker has been recently studied. It was identified in the epithelium of the distal epididymis and was predicted to be a protease inhibitor involved in sperm maturation [5]. In 2003, HE4 was approved by the FDA as a serum tumor marker for ovarian carcinoma and attracted great attention[6]. Recent studies indicate that HE4 is highly expressed in ovarian and endometrial carcinoma tissues with increased serum level in these patients as well[7].

Materials and Method

This prospective cohort study included 100 women with PMB who were recruited from Kasr Al Aini Hospital, Cairo University, Egypt between June 2014 and August 2016. An informed written consent was obtained from all participants prior to inclusion.

All patients included in the study had single or multiple episodes of PMB with an ET of more than 5mm. Exclusion criteria were having history of other malignancies, history of intake of chemotherapy or radiotherapy, the use of hormone replacement therapy, and being unfit for surgical intervention.

Full history was taken (including the duration of menopause, the number of episodes of PMB, and previous investigations and current medications), general examination was performed (including blood pressure measurement, calculation of body mass index (BMI= weight (kg)/[height (m)]^2, and the presence of any signs of systemic diseases), and local examination was performed for all patients.

Transvaginal ultrasound (TVS) done by the same observer to nullify the effect of inter observer variability.

For the level of HE4: 5 ml of venous blood were withdrawn from all patients. The samples were left to clot. The separated sera were stored at -20˚ until all samples were obtained. Frozen samples were allowed to reach room temperature prior to use. Samples were then mixed thoroughly by gently inverting multiple times before analysis. HE4 was quantitatively assayed using the enzyme immunoassay (EIA) method (Fujirebio Diagnostics, Inc. Göteborg, Sweden). The functional sensitivity of the HE4 EIA is ≤ 25pM. The analytical specificity is 100 ± 15%.

All patients were then submitted to hysteroscopy under general anesthesia and guided endometrial biopsy.

Definitive management was later performed in the form of total abdominal hysterectomy, bilateral salpingooophrectomy, with or without pelvic lymph nodal dissection and histopathological examination.

Results

Women with malignancy had significantly older age, lower parity, higher BMI and longer duration of menopause when compared to those with non-malignant lesion (table 1).

ET of the malignant group was significantly higher than that of the non-malignant group (20.33 ± 7.4 versus 12.68 ± 4.22mm, p: <0.001), level of preoperative serum HE4 was significantly higher in the malignant group as compared to the non-malignant group (390.92 ± 351.72 versus 61.25 ± 31.65pmol/L, p: <0.001) (table 1).

The level of HE4 in different endometrial pathologies of the cases group is presented in (table 2).

A scale was proposed in which the endometrial pathologies were arranged in a descending manner according to the severity of the lesion, where malignancy was the severest, followed by AEH, then SEH, and atrophic endometrium being the least severe form. Hence, correlation between the preoperative HE4 level and the severity of the endometrial lesion could be evaluated. This study showed that there was a significant strong positive correlation between the preoperative level of HE4 and the severity of the endometrial pathology (r= 0.735, p: <0.001).

ROC curve was generated to evaluate the performance of the preoperative level of HE4 in distinguishing malignant from non-malignant endometrium (figure 1).

Using the cut-off value of 69.5 pmol/L for preoperative HE4 yielded a sensitivity of 75%, a specificity of 88.5% and an AUC-ROC of 0.933 (table 3).

All malignant cases (12 cases) were of the endometrioid type, 5 were stage Ia, 5 were stage Ib, and 2 were stage II. All were operable and a total abdominal hysterectomy and bilateral salpingo-oophorectomy with pelvic lymphadenectomy was performed for all.

For the degree of differentiation, 2 cases were grade 1 (G1), 8 cases were grade 2 (G2), and 2 cases were grade 3 (G3).

Multivariate stepwise linear regression for factors with significant differences between malignant and non malignant cases as age, parity, and duration of menopause are shown in table 4.

The level of HE4 in the malignant cases according to the tumor stage, grade and lymph node involvement is described in table 5.

Discussion

In this study, we focused on examining the role of HE4 in distinguishing malignant from non-malignant lesions of the thickened endometrium in women with PMB through histopathological examination of hysteroscopic directed endometrial curettage followed by hysterectomy, and to correlate HE4 level with the endometrial lesion.

The prevalence of EC in the present study was 13.3%. This is similar to that reported in previous studies[8].

HE4 is a new detection index. Being highly expressed in ovarian and endometrial carcinoma cells [7].

In this study, the preoperative level of HE4 was significantly higher in the endometrial carcinoma cases than its level in the non-malignant cases.

HE4 actually exists in normal tissues e.g. male vas deferens, mammary gland epithelium, female genital tract including the endometrium [9]. So its level is suspected to increase with increased endometrial thickness. As suspected its level is increased in cancers arising from these tissues [10].

The National comprehensive cancer network in 2012 signified the value of HE4 as a tumour marker for epithelial ovarian tumors and as both the uterus and the ovary share a common embryological origin so HE4 can be used as a marker for endometrial tumors [11].

In the present study, upon examining the diagnostic performance of HE4 in predicting the presence of EC among patients with PMB, using the cut-off value of 69.5 pmol/L for preoperative HE4 yielded a sensitivity of 75% and a specificity of 88.5%, and an AUC-ROC of 0.933, Having more serious consequences separating AEH and EC patients from SEH and atrophic endometrium cases,HE4 was significantly higher in the former group 218.14 ± 273.46 versus 54.2 ± 22.45, $p < 0.001$ with a new cut off value calculated to help differentiation of AEH and EC cases, HE4 value of 62.5 pmol/L yielded a sensitivity of 85.9% and specificity of 62.9% with AUC of 0.832 .

Similar to our findings, previous study on 2015 reported the sensitivity and specificity of HE4 in distinguishing EC patients from healthy females were 62.2% and 95% respectively, with an AUC of 0.996 . Another one on the same year reported a sensitivity of 72.4% and a specificity of 75.4% for the cut-off 76.5 pmol/L [15]. Also, Capriglione et al in 2015 [16] reported sensitivity and specificity that are near to ours in detecting EC patients 83.3% and 96% respectively.

An earlier study on 2013 has reported that the sensitivity of HE4 in detecting malignant cases was 75% and the specificity was 65.5%, and that the sensitivity was improved after combining HE4 with other markers (CA-125, CEA, and serum amyloid –A) to be 84% [13].

Another publication in the same year revealed that the sensitivity of HE4 in detecting malignant endometrium was 59.4% with 100% specificity for the cut-off value of 70pmol/L. After adding CA-125, the sensitivity was elevated to be 60.4%. The authors concluded that HE4 at cutoff of 70 pmol/L yields the bestsensitivity and specificity [12]. The lower sensitivity of the marker in their study compared to ours might be due to that they took into consideration other types of EC while all our cases were of the endometrioid type.

Previous study on 2016 have reported that HE4 was significantly higher in grade 3 (G3) carcinomas compared with grade 1 (G1) and 2 (G2), and that patients who needed lymphadenectomy had significantly higher HE4 level than those who had no indications for this procedure[14].

A recent study on 2017 stated that preoperative serum HE4 is significantly correlated with primary tumor diameter and depth of myometrial invasion, but not with tumor grade or cervical involvement and lymphovascular infiltration and that serum HE4 levels could be useful in identifying EC patients at high risk of lymphatic spread who would benefit from lymphadenectomy[17].

A meta-analysis done in 2014 reported that HE4 is the most accurate and sensitive EC marker identified to date. In particular, this new marker seems to have a good performance in diagnosis. The best cut-off of HE4 in diagnosis ranges between 50 and 70 pmol/L, resulting at least in 78.8% of sensitivity and 100% of specificity in

all stages. Another important aspect to consider is HE4 capacity in predicting the stage of disease and myometrial involvement, which can help scheduling the appropriate timing of imaging and surgery in a more individualized fashion and as indicator of patient prognosis[18].

Our study confirmed the known fact that malignancy is suspected to be found in women with postmenopausal bleeding when they are older, lower parity, higher BMI and have longer interval between menopause and presentation.

ACOG confirmed these findings by stating that the clinically identified risks for carcinoma endometrium include age and high body fat [19].

The present study is strengthened by its prospective nature, and that it depended on hysterectomy specimen for diagnosis of different endometrial pathologies as well as malignancy, beside the analysis of positive results of lymphadenectomy.

The main limitation of the study is the small sample size included which resulted in a limited number of malignancy cases with the resultant limited variations in malignancy stages and pathological subtypes. Larger number of participants would have better detected the value of the studied marker (HE4) in diagnosis and prognosis of endometrial malignancies. Nevertheless, the study highlighted the presence of this new marker and pointed to its possible value in diagnosis of the disease and the prediction of its occurrence at certain cut-off value with the reported sensitivity and specificity.

Table (1): Characteristics of the studied population

	Malignant Group (n=12)	Non-malignant Group (n= 78)	P value
Age (Years)	63.5 ± 6.86	55.97 ± 5.68	<0.001
Parity	2.67 ± 1.49	4.71 ± 2.15	0.002
BMI (Kg/m2)	37.19 ± 5.58	32.95 ± 6.49	0.034
Duration of menopause (Years)	11.67 ± 5.41	4.83 ± 4.26	<0.001
Endometrial thickness (mm)	20.33 ± 7.4	12.68 ± 4.22	<0.001
Preoperative HE4 (pmol/L)	390.92 ± 351.72	61.25 ± 31.65	<0.001

Data are presented as mean±SD

Table (2): Level of HE4 in different endometrial pathologies

	EC (n= 12)	AEH (n= 16)	SEH (n= 51)	Atrophic endometrium (n= 11)	P value
HE4 (pmol/L)	390.92 ± 351.72	148.44 ± 67.34	51.26 ± 28.59	38.33 ± 27	<0.001

Data are presented as mean±SD

Table (3): Tests of diagnostic accuracy of preoperative HE4 level in distinguishing malignant from non-malignant endometrium

		Cut-off value	Sensitivity (%)	Specificity (%)	AUC-ROC	PPV	NPV	Accuracy
HE4 level (pmol/L)	Malignant versus non-malignant cases	69.5	75	88.5	0.933	50	95.8	86.7

Table (4): Multivariate stepwise linear regression for age, parity, and duration of menopause

	Beta Coefficient (Adjusted)	S.E.	Wald	p value	OR	95% CI for OR	
						Lower	Upper
Age	0.259	0.294	0.779	0.377	1.296	0.729	2.304
Parity	-1.064	0.492	4.676	0.031	0.345	0.132	0.905
Duration of Menopause	0.189	0.253	0.557	0.455	1.208	0.735	1.985

Table (5): The level of HE4 in the malignant cases according to the tumor stage, grade and lymph node involvement

	No. Patients	HE4 level	P value
Figo stage			
I	10	322.56±182.66	Ia vs Ib =0.012 Ib vs IIa=0.241 I vs II=0.001
Ia	5	262.32±319.51	
Ib	5	435.4±293.59	
IIa	2	501.72±423.74	
Grade			
G1	2	82.16±55.23	<0.001
G2	8	308.89±275.85	
G3	2	920.54±166.17	
Lymph nodes			
Positive	3	635.42±426.88	<0.001
Negative	9	167.84±112.43	

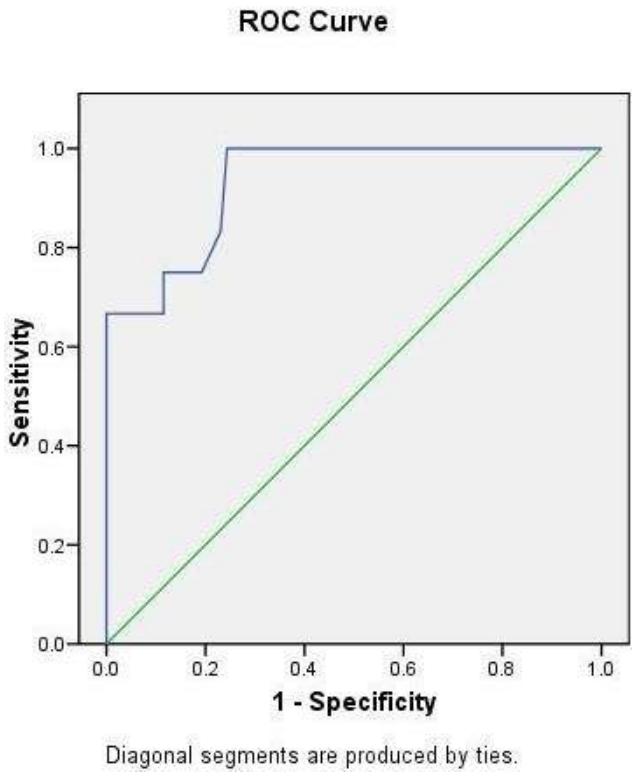

Figure 1: ROC curve

Conclusion

HE4 can predict endometrial pathology in women with PMB with a high specificity and a fair sensitivity.

Conflict of Interest: The authors have no conflicts of interest.

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Evaluation of Eye Relaxation to Decrease Eye Strain in PT Japfa Comfeed Indonesia Unit Sragen

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Abstract

Office worker currently relies heavily on the role of the computer to make work easier to input, processing, storage and transmission of data. The work at the office of PT Japfa Comfeed Indonesia Sragen is a job that demands labor staring at a computer screen for 8 hours per day, 5 days a week. However, looking at a computer screen for a long time can give negative effects called eyestrain which complaints such as: dry eye, red eye, eye sore, feels the eyes of blur, the eyes become doubles, headaches and neck strain. This research is a study of experiments provide relaxation eye on workers. Before working, eyestrain of worker group A and B were measured, then group A was given a relaxation of the eyes while the B was not. At the end of the work, the eyestrain of group A and B were measured again. The results of this research show that there are significant differences between the group A and B of workers with eyestrain. It can be drawn the conclusion that granting eye relaxation on workers using computer were able to decrease the complaints of eyestrain. The eye relaxation will have an optimal positive effect in reducing eye fatigue if the workers do correctly and routinely on every working day.

Keywords: *Eye Relaxation, Eye Strain.*

Introduction

Currently, computer users in Indonesia recorded about 55 percent of 88.1 million internet users[1]. Staring at the computer screen can cause an impact such as the strain-muscles of the eyes, neck pain, headaches, and dry eye. In 2016, as much as 90 percent of computer users in the United States are exposed to radiation from a computer screen more than 9 hours of work, while the common complaints can arise at least after the first two hours of work, and there were 57.8 percent of computer users had experienced the eyestrain[2]. Globally, prevalence of eyestrain in the world has reached 64-90 percent[3]. If the complaint of the eyestrain experienced by the workers are not prevented, that could arise more serious things such as strain on eyes and a decrease the ability of the eye's accommodation or loss of vision function[4]. One of the solution for the eyestrain is Eye Relaxation which is called 20's Rule.

Field survey was done by the researcher at PT. Japfa Comfeed Indonesia Tbk Unit Sragen found that about 70% of workers using computer complained of dry eye, and eye strain. These condition needs to be worried and should be given a prevention so as not to be worse.

Materials and Method

This study is experimental study with a certain eye relaxation. This research conducted at PT. Japfa Comfeed Indonesia Tbk Unit Sragen on Juni 2017. The population of the research are workers using computer at PT. Japfa Comfeed Indonesia Tbk Unit Sragen, with number 50 workers.

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Relaxation is a series of eye relaxation activities which include: close the eyes for 10 seconds and open the eyes for 10 seconds with viewing direction ahead as far as 6 meters. That must be done three times, conducted every 20 minutes of exposure to radiation electromagnetic waves.

Measurement of the eye strain is using Questionaire CVSS17 that adopted from Gonzalez-Perez *et al* on 2014[5].

Findings:

Table 1: Respondents' Characteristics

Characteristics	Min	Max	Mean	SD
a. Group A				
1. Age (Years)	20.00	45.00	34.92	7.79
2. Work period	0.33	22.00	9.57	7.67
3. Eye Strain (Score)	15.00	33.00	21.00	5.16
b. Group B				
1. Age (Years)	23.00	45.00	33.04	7.12
2. Work period	2.00	22.00	7.88	7.25
3. Eye Strain (Score)	15.00	31.00	21.52	4.92

Source: Primary Data, June 2017.

This research show that characteristics of respondents is like bellow:

Table 2: Distribution of Respondents' Characteristics

Characteristics	Frequency	Percentage
Age (Years)		
20-29	16	32%
30-39	18	36%
40-49	16	32%
Work Period		
<5	20	40%
5-9	14	28%
10-14	3	6%
15-19	3	6%
>19	10	20%
Sex		
Male	40	80%
Female	10	20%

Source: Primary Data, June 2017.

Table 3: Statistical Analysis

Characteristics	p-value	r
a. Age Group A	0.177	0.279
b. Term of work Group A	0.700	-0.081
c. Sex Group A	0.154	0.294
d. Age Group B	0.227	-0.251
e. Term of work Group B	0.769	0.062
f. Sex Group B	0.974	-0.007

Source: Primary Data, June 2017.

From the statistical analysis above show that Respondents' Characteristics including age, work period, and sex of each group are not significantly related with eye strain of the workers. Then, the statistical analysis by *Independent T-test* shows that there is a significant differences between eye strain of workers in the group A and B, with the *p value* = 0.000.

Eye relaxation activities can reduce the fatigue or strain of workers' eyes because of staring at computer screen. This decrease occurs because of changes in the condition of the eye muscles. When looking at a computer screen, the eye muscles work to focus on the computer screen and experience tension due to maximum accommodation. Eye relaxation is done by changing the visibility of workers, seeing objects with a distance of six meters. Visibility change causes the eye muscles to relax and relax. Eyes that focus on a computer screen can trigger dry eyes. Eye relaxation is done by blinking at the object with a distance of six meters can help even the tears to the entire surface of the eye, so that the eyes stay awake in humid conditions. Statistically it also shows that there is a significant effect of eye relaxation on eye strain. The results of the study of Barthakur (2013) also showed that eye relaxation significantly affected eye strain[6].

The group A who did eye relaxation had a lower eye strain score compared to the group B who did not relax the eye with an average difference of 0.52. The difference shows a decrease in eye strain by 2.4%. The results of the study by Lertwisuttipaiboon *et al* (2016) also showed that giving eye relaxation can significantly reduce eye strain[7]. Another study was conducted by Gupta *et al* (2014) and it was proven that eye relaxation can reduce eye strain by 46.5% [8].

Eye strain can arise as the duration of a person stares at a computer screen[9]. Thorud *et al* (2012) showed that eye muscle strain arises after sixty minutes of accommodation. Eye relaxation activities are carried out every twenty minutes after staring at the computer screen. This activity is one of the steps to prevent eye strain, which is done before the eye muscles begin to experience significant tension[10].

Workers in this study have characteristics ranging in age from 20 to 45 where at that age a person naturally has normal functioning vision. Guyton and Hall (2014) also stated that someone over the age of 45 years will experience a decrease in accommodation power which will then affect the working of the eye muscles[11]. Test of correlation between age and eye strain in the two groups in this study showed a non-significant relationship, namely *p value* = 0.177 and *p value* = 0.227. The results of this study are supported by previous studies indicating that age does not have a significant relationship to eye strain (*p value* = 0.716)[12]. Das *et al* (2016) research also shows that age under 45 years does not have a significant relationship to eye strain (*p value* = 0.939)[13].

A total of 40 workers (80%) in this study were men where the remaining 10 workers (20%) were women. Correlation test in the control group and intervention in this study showed that gender did not have a significant relationship to eye strain, *p value* = 0.154 and *p value* = 0.974. This research is in line with the research of Zainuddin and Isa (2014) with *p value* = 0.205[12]. Another characteristic inherent in the workers of this study is the period of work. The results of the correlation test between work period and eye strain in the two groups showed a non-significant relationship, amounting to *p value* = 0.700 and *p value* = 0.769. This result is in line with the Arumugam study (2014) which shows that there is no relationship between years of service with complaints of eye strain(*p-value* = 0.328) and Zainuddin and Isa (2014) with *p value* = 0.664[14]. This study shows that all inherent characteristics of workers are not significantly related to the perceived strain of workers.

This study shows that all the characteristics inherent in the respondents were not significantly related to the perceived eye strain of the respondents. Giving eye relaxation in the intervention group produced an average eye strain score of 21.00 while in the control group had an average eye strain score of 21.52. Statistically, the strain scores of the two groups had significant differences. As for other factors that can trigger eye strain so that only the difference in eye strain was obtained in both groups of workers by 0.52 or 2.4%, may caused by the technique of implementing inappropriate to eye relaxation, history of eye disease (myopia, hypermetropy and astigmatism).

Conclusion

Based on this research, it can be conclude that: There is a difference of the eye strain significantly between Group A and B due to granting eye relaxation, amounted to 2.4% decrease eyestrain of workers who perform a eye relaxation.

1. Characteristics of the workers in this research include age, period of employment and gender have no risk to experience eyestrain.
2. Doing the eye relaxation as well as the workers' try to do, relax the eye correctly and routinely on every working day so that workers can get optimal results of doing the eye relaxation.

Conflicts of Interest: All of Authors have no conflicts of interest to declare.

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Ethical Clearance: The study was approved by the institutional Ethical Board of Dr. Moewardi Hospital, Surakarta with the registration number: R0213002-4547.

All of subjects were fully informed about the procedures and objectives of the study then each subject signed an informed consent form.

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Effectiveness of Dorsata Honey Suplement on Interleukin-3 Levels in Breast Cancer Patients Who Underwent Chemotherapy

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Abstract

Chemotherapy causes debilitating side effects include a decrease in blood cell counts. Interleukin-3 (IL-3) is a hematopoietic growth factor with extensive and multipotent activity. Honey is a natural product that has been widely used and researched for its therapeutic effects including increase the formation of blood cells. The purpose of this study was to determine the effect of honey supplement to IL-3 levels in breast cancer patients who underwent chemotherapy. The study sample included all populations diagnosed with breast cancer by the clinician in the Surgical Oncology Department of Dr. Wahidin Sudirohusodo Hospital Makassar who met the criteria for the period September to November 2018, divided into two groups, intervention and control. The intervention group was given honey orally three times a day at a dose of 15 ml (2 tablespoons) for 15 days. Examination of blood samples to measure IL-3 levels through ELISA. The statistical analysis performed is descriptive statistic calculation, frequency distribution and Chi Square statistical test, Independent-t and Paired-t test, with P <0.05. The results of this study showed a significant increase in mean IL-3 levels in the group that received honey which was 70.07 pg/dL compared to 143.46 pg/dL with an average increase of 73.4 pg/dL (104.7%; p < 0.05), while the group that did not get honey did not experience a statistically significant change of 88.88 pg/dL compared to 84.36 pg/dL, the mean decrease was 4.52 pg/dL (5.1%; p> 0.05). Conclusion: Honey supplementation increases IL-3 levels in breast cancer patients underwent chemotherapy.

Keywords: *Breast Cancer, Chemotherapy, Interleukin-3, dorsata, honey.*

Introduction

Breast cancer is the most malignancy in women and affects the lives of one in 10 women. Breast cancer is the leading cause of death in women worldwide, representing 38 million (23%) of total new cancer cases and 458,400 (14%) of total cancer deaths in 2008.[1] In 2015 an estimated 231,840 new breast cancer cases were found in women and 40,730 deaths due to breast cancer occurring in the United States. [2]

Breast cancer therapy requires multiple therapeutic modalities, each of which has its own advantages and disadvantages. Some of them are surgery, chemotherapy, radiotherapy, hormonal therapy and molecular therapeutic targeting. As one of the modalities in the treatment of breast cancer, chemotherapy still has a major role in the treatment of patients with breast cancer. Widely used as adjuvant therapy after patients undergo surgical removal of tumors for healing or preventing recurrence and as palliative therapy in patients with metastatic disease. Chemotherapy causes a wide range of effects that cause symptoms that weaken and greatly affect the quality of life of patients. Nausea, vomiting, hair loss and a decrease in the number of blood cells are the most frequent acute side effects. Decreasing the number of blood cells can be a decrease in the number of erythrocyte cells (anemia), platelets (thrombocytopenia) and white blood cells (leukopenia). In chemotherapy, neutropenia associated with chemotherapy doses is at risk for infection. Thrombocytopenia is another problem with the toxicity of chemotherapy which can lead to delayed chemotherapy, reduction in dosage and requiring platelet transfusion

Interleukin-3 (IL-3) is a hematopoietic growth factor with clear thrombopoietic activity and extensive

and multipotent activity. IL-3 is a glycoprotein which is produced mainly by activated T cells. IL-3 regulates the proliferation and differentiation of pluripotent stem cells and progenitor cells from various hematopoietic lineages, including megakaryocytes, granulocytes, and erythrocytes. IL-3 also stimulates the function of several adult cells, including neutophils, eosinophils and monocytes. Available for clinical trials since 1993, IL-3 has been used by more than two thousand patients. From the research data so far it has been shown that IL-3 alone or in combination with other cytokines has become the first thrombopoietic factor available for clinical use which allows patients to undergo chemotherapy at intervals and doses according to standards that are expected to increase recovery rates. Recombinant human (rh) IL-3 has been evaluated in patients undergoing cancer chemotherapy, after bone marrow transplantation, bone marrow failure, for blood mobilization and hematopoietic progenitor cell transplantation and in combination with other Colony-stimulating factors (CSF) including Granulocyte -macrophage (GM) -CSF and granulocyte (G) -CSF. Results from stage I-II studies indicate that IL-3 alone or in combination with G- or GM-CSF can reduce or eliminate the duration and severity of thrombopenia and reduce neutropenia. [3]

Honey is a natural product that has been widely used for its therapeutic effects. It has been reported that honey contains more than 200 substrates. Its main composition is glucose and fructose but also contains fructo-oligosaccharides and many amino acids, mineral vitamins and enzymes. The composition of honey varies depending on the plant's nectar source. But almost all honey contains flavanoids (such as apigenin, pinocembrin, kaemferol, quercetin, galangin, chrysin and hesperin), phenolic acids (such as ellagic, caffeic, p-coumaric and ferulic acid), ascorbic acid, tocopherols, catalase (CAT), superocside dismutase (SOD), reduced glutathione (GSH), Milard reaction products and peptides. Most of these components work together to provide a synergistic antioxidant effect. Honey has long been used in health, both as a supplement and in medicine. Because of its potential, research on honey has begun to be carried out.[4] Flavanoids and polyphenols are the two main bioactive molecules present in honey. According to modern scientific literature, honey has a protective effect for therapy in various conditions such as diabetes, respiratory, gastrointestinal, cardiovascular and nervous systems, even useful in cancer therapy. Honey should be considered a natural therapeutic agent for disease conditions and therefore the use of honey in clinical care is highly recommended.[5] Some studies have mentioned the effects of honey as an antioxidant, natural antimicrobial, immune booster, anti-inflammatory, potentially in cancer therapy and can increase the formation of blood cells. From studies it has been found that there is an increase in CD4, CD8, erythrocytes, leukocytes, platelets, neutrophil counts and lymphocytes after 30 days of honey intake.[6] This is important because CD4, CD8 and lymphocytes are the main sources of IL-3. From other studies honey is also effective in reducing the incidence of anemia in 64% of patients and decreases the incidence of severe neutropenia, although 40% of patients still need CSFs.[7]

From the above, it is necessary to study the effects of honey on the levels of Interleukin-3 breast cancer patients who are undergoing chemotherapy because Interleukin-3 greatly affects the process of hematopoiesis, especially in breast cancer patients who underwent chemotherapy with the potential for interference. The purpose of this study was to determine the effect of giving honey to IL-3 levels in breast cancer patients who underwent chemotherapy

Materials and Method

Collection of Samples: This study was a experimental study using the pretest-posttest group control model, the experimental effects were measured before and after treatment. The study sample was the population of breast cancer patients, diagnosed by the clinician in the Surgical Oncology Department of RSUP Dr. Wahidin Sudirohusodo Makassar, from September to November 2018.

Inclusion criteria: Adult women diagnosed with locally advanced breast cancer by the clinician in the Surgical Oncology Departement and confirmed by histopathological examination, had never received breast cancer therapy, were willing to take part in the study by signing an informed consent.

Exclusion criteria: Lipemic, jaundice or hemolysis specimens, patients detected with other primary malignancies.

The study began with random sample selection for the control group and intervention group. Each informed consent was given, for the treatment group, dorsata honey was given orally three times a day (morning/ afternoon/night) at a dose of 15 ml (2 tablespoons) for

15 days. And for the control group recommends patients to take vitamin supplements and nutritious foods. Blood sampling as inspection is done twice, before the start of the intervention (day 0 chemotherapy), and then continued the examination of 2nd samples on day 16th (post chemotherapy). Interleukin-3 levels were measured from blood plasma samples and measured by ELISA.

Data Analysis: All collected data are grouped according to the purpose and type of data, then analyzed using SPSS version 22. The statistical analysis performed is descriptive statistic calculation, frequency distribution and Chi Square statistical test, Independent-t and Paired-t test, with P <0.05.

Ethical Clearance: Ethical approval for this study was obtained from the Research Ethics Committee, Faculty of Medicine, Hasanuddin University, Makassar, Indonesia. Number; 732/H4.8.4.5.31/ PP36-KOMETIK/2018.

Results

Sample Characteristics: The samples analyzed were 30 breast cancer patients, consisting of groups who received honey supplements (intervention) and groups that did not get honey supplements (controls), each of them 15 people. The age of subjects was 23-61 years with a mean of 47.3 ± 7.5 years (median 47 years). The results of IL-3 measurements before chemotherapy varied between 11.78-350.00 pg/dL with a mean of 79.47 ± 70.70 pg/dL (median 63.6), whereas after chemotherapy had a value between 35.64-350.00 with an average of 113.91 ± 87.54 pg/dL showed in Table 1.

Table 1. Age and IL-3 Descriptive Statistics (n = 30)

Variable	Min (pg/dL)	Max (pg/dL)	Median	Mean	SD
Age	23	61	47,00	47,30	7,51
IL-3 Before Chemotherapy	11,78	350,00	63,60	79,47	70,70
IL-3 After Chemotherapy	35,64	350,00	82,83	113,91	87,54

The distribution of samples based on chemotherapy regimens, histopathology grading and stadium showed that most subjects received TAC (docetaxel, adriamicin, cyclophosphamide) chemotherapy (76.7%), grade moderate (83.3%) and stage III B (73, 3%) showed in Table 2.

Table 2. Distribution of Chemotherapy Regiment, Histopathological Results, Grading and Stage of Carcinoma Mammae

Variable		n	%
Chemotherapy Regiment	TAC (Docetaxel, Adriamycin, Cyclophosphamide)	23	76,7
	CAF (Cyclophosphamide, Adriamycin, Fluorouracil)	7	23,3
Grade	Low	1	3,3
	Moderate	25	83,3
	High	4	13,3
Stadium	III A	2	6,7
	III B	22	73,3
	III C	6	20,0

Comparative Analysis of IL-3 Levels by Group: The mean IL-3 level before chemotherapy was found to be higher in the control group than in the intervention group, which was 88.88 pg/dL compared with 70.07 pg/dL, although it was not statistically significant (p> 0.05). showed in table 3.

Table 3. Distribution of Chemotherapy Regiment, Histopathological Results, Grading and Stage of Carcinoma Mammae

Variable	Group	N	Mean	SD	P
IL-3 Before Chemotherapy	Intervention Control	15 15	70.07 88.88	69.45 73.08	0.476
IL-3 After Chemotherapy	Intervention Control	15 15	143.46 84.36	112.20 37.61	0.070

The mean IL-3 levels after chemotherapy were found to be higher in the intervention group than in the control group, namely 143.46 pg/dL compared to 84.36 pg/dL, although it was not statistically significant ($p > 0.05$). showed in table 3.

In the intervention group, there was a significant increase in IL-3 levels after chemotherapy compared to before chemotherapy, which was 143.46 pg/dL compared to 70.07 pg/dL ($p < 0.05$). The mean increase in IL-3 after chemotherapy was 73.4 pg/dL or increased by 104.7%. showed in table 4.

Table 4. Comparison of IL-3 levels before and after chemotherapy

Group	Variable	N	Mean	SD	P
Intervention	IL-3 Before Chemotherapy IL-3 After Chemotherapy	15 15	70.07 143.46	69.45 112.20	0.01
Control	IL-3 Before Chemotherapy IL-3 After Chemotherapy	15 15	88.88 84.36	73.08 37.61	0.84

In the control group, there was a decrease in IL-3 levels after chemotherapy compared to before chemotherapy, namely 84.36 pg/dL compared to 88.88 pg/dL, but not statistically significant ($p > 0.05$). The mean reduction in IL-3 after chemotherapy was 4.52 or decreased 5.1%. showed in table 4.

Discussion

In this study, there were 30 samples of breast cancer patients where 15 were given treatment and 15 were controls. The age of subjects was 23-61 years with a mean of 47.3 ± 7.5 years (median 47 years). From this study, the average age of respondents was 47 years. This is in line with the journal presented by Irwan in 2014 which stated that the incidence of breast cancer was more in patients over the age of 40 years. The Partini study in 2016 showed the same pattern.[8]

Based on grade, the highest was moderate grade (83.3%). This is in line with the intensive study in 2010 where it was stated that moderate grade was the most common tumor grading. Research data by Irwan also showed the same thing.[7,8]

Stage III B (73.3%) is the most common stadium found in this study. Partini in 2016 stated that the most stadiums were stage III B. So this study had stadium distribution conformity with the research.[10]

The mean IL-3 level before chemotherapy was found to be higher in the control group than in the intervention group, which was 88.88 pg/dL compared with 70.07 pg/dL, although it was not statistically significant ($p > 0.05$). This shows that although the average IL-3 level before chemotherapy in the control state is higher than the intervention group does not have a statistical effect.

The mean IL-3 levels after chemotherapy were found to be higher in the intervention group than in the control group, namely 143.46 pg/dL compared with 84.36 pg/dL, although it was not statistically significant ($p > 0.05$). This shows that although the rate of IL-3 levels after chemotherapy in the intervention group was higher than the control group did not have statistical effect. When viewed from changes in IL-3 levels between before and after chemotherapy, in the control group there was a decrease in the mean IL-3 levels in the control group 84.36 pg/dL compared to 88.88 pg/

dL, but not statistically significant (p> 0.05). The mean reduction in IL-3 after chemotherapy was 4.52 pg/dL or decreased 5.1%.

According to Verma et al .'s study, it was said that T lymphocyte levels, B lymphocytes and NK cells decreased significantly within 2 weeks after chemotherapy even especially B cells and CD4 T cells remained significantly decreased in 9 months post chemotherapy. [11] In another study, Mackall said that although the number of neutrophils, monocytes and platelets consistently improved due to therapy at the end of each cycle, the number of lymphocytes did not improve in the same period of time. Because CD4, CD8 and lymphocytes are the main sources of IL-3, of course this affects the IL-3 levels.[12]

Whereas in the intervention group there was an increase in the mean IL-3 level of 143.46 pg/dL compared to 70.07 pg/dL (p <0.05). The mean increase in IL-3 after chemotherapy was 73.4 pg/dL or increased by 104.7%. Honey supplementation according to Heidari in his research led to an increase in CD4, CD8, erythrocytes, leukocytes, platelets, neutrophil counts and lymphocytes after 30 days of honey intake. [6] In addition, Porcza in a review of his study said that consumption of honey 1.2 g/kg body weight dissolved in 250 cc of water could produce a 50% increase in the number of peripheral monocytes and slightly increase the presentation of lymphocytes and eosinophils. [13] This increase in cells can increase IL-3 levels according to this study. Even honey supplements are also given to reduce the incidence of anemia in 64% of patients and reduce the incidence of severe neutropenia in chemotherapy patients whose treatment is by giving CSFs including human IL-3, although 40% of patients still need CSFs.[7]

Conclusion

The result of this study shows that honey supplementation increases IL-3 levels in breast cancer patients underwent chemotherapy. Suggested to for honey supplements in breast cancer patients undergoing chemotherapy so that the patient's IL-3 levels are maintained.

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Effect of Blood Sampling Method During a Mating Time in Male Camels (Dromedary Camels)

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Abstract

This study was to shed light on levels of testosterone and cortisol hormones in male dromedary camels during the mating time, by collection the blood samples using the manual method and compared with the remote-controlled blood sampling (RBS) method, to assess whether either these method had affected changes in the concentration of the hormones or not. The blood samples were collected from fifteen adult male camels, via two experiment with one-day intervals: first experiment by manual method during three periods (pre-mating, mating, and post-mating) one hour between each period, and the second experiment by the RBS in the same protocol. The serum testosterone and cortisol concentrations of all animals were determined via ELISA technique. The result which appearance a significant difference in the mating time used RBS compared with manual method. These findings might be due to the withdrawal of blood remotely which could cause a reduction of excitement in animals using the manual blood sampling at the presence of veterinarians, so it was considered as an ideal method to measure hormonal concentrations, especially in experiments which need accurate results.

Keywords: *Camels, Cortisol, Mating, Remote-Controlled Blood Sampling, Testosterone.*

Introduction

The breeding season of dromedary camels is at the coldest winter months of the year[(1)]. In this season, these camels become very aggressive towards other males and humans and their handling is thus considered very difficult and the copulation begins with foreplays and such behaviors are disappeared after rutting[(2)]. Most researchers have adopted different procedures to determine the blood testosterone level in order to clarify the characteristics of reproductive phenomena, reach an understanding of physiological status, and also determine libido and sexual behaviors in these animals[(3)]. The cortisol hormone has been similarly used as an indicator of stress in dromedary camels[(4)] and in other animals[(5)], the serum cortisol which increases during acute stress is largely made up of free cortisol; therefore, its concentration can be influenced by stress and physical stimulation of dromedary camels when they are exposed to stressors which also cause deregulation of sexual hormones[(6,7)]. Collection of blood samples to measure hormones can be invasive, and values can potentially be confounded by handling stress which may lead to alternative measurements of hormone levels[(8)]. In this respect, remote-controlled blood sampling (RBS) is a powerful device to take blood samples and consequently give important information on animal health status, like hormonal access[(9)], yet the traditional or manual blood sampling method has its own restrictions and it cannot be possibly used due to male camel aggression during this time. The same restrictions can also lead to stress reactions even in animals accustomed to the given procedure[(10)] which results in increased levels of cortisol due to the activation of hypothalamic stimulation-pituitary-adrenal axis during this sampling[(11)]. It is clear that the RBS device placed on animals will be more convenient than the manual blood sampling method, especially when a series of blood samples are needed [(12)]. Accordingly, the present study aimed to verify the levels of testosterone and cortisol hormones in the breeding season of male dromedary camels during the mating time. To this end, blood samples were taken using the traditional method and compared with the levels of these hormones using the RBS device, to assess whether either the given method had affected changes in the concentration of

the hormones or not, and to improve understanding of reproductive mechanisms and development.

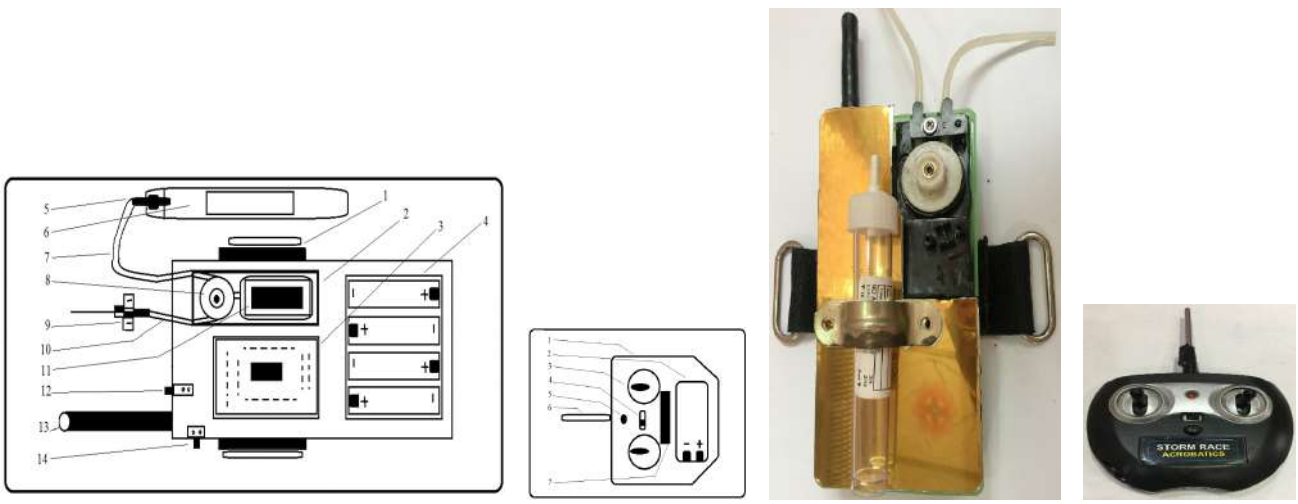
Materials and Method

The present study was conducted in the bio-molecular laboratory of the College of Biotechnology at the University of Al-Qadisiyah, Iraq. The blood samples were then collected from camel herds in southern of Iraq, during the rutting season (December-February/2017-2018), with intervals. There were a fifteen of adult males (8-10 years of age) with good bodily conditions. Animals' age was also determined based on dental formula described in Ibrahim et al [13].

Experimental Protocol: All samples were collected by two experiments with a one-day interval from a total numbers of the male camels marketed from dromedary camels which were clinically healthy.

First Experiment: The blood samples (5 ml) were collected from the jugular vein by the manual (traditional) method via syringe (gauge 18) in three periods. The first period was before the male camel's exposure to estrus she-camel (pre-mating), the second period occurred one hour following the first period during the copulation time (mating period), and the third period took place after one hour from copulation (post-mating). In this experiment, the researchers had great difficulty in blood sample collection due to the camels became very dangerous and often unfriendly, so the camels were frequently motion and kicking. They also lost the jugular vein was puncture and occasionally the needle and the syringe were broken.

Second Experiment: Following one day after the first experiment, the blood samples were taken remotely in the same periods by the made locally modified RBS device of the AUTOMATIC BLOOD SAMPLING which used by Fonss A and Munksgaard[9] which was to reducing the weight, size and facilitate its fixation on the camel's neck using installation belts to prevent animal sensitivity and reduce nervousness (Figure 1). All blood samples were further allowed to clot for two hours at room temperature and then centrifuged for 20 minutes at 3000 rpm., the supernatants were also collected carefully, and then placed in the eppindroph tub before storage at -20°C until hormonal analysis.



(a) (b) (c) (d)

Fig. 1: (a) a chart of the RBS device (modified): 1-Restraint rings, 2-Motor base, 3- Receiver, 4-batteries (6 volt), 5-Plastic crosslink, 6-Test tube, 7-Pipes, 8-Peristaltic pump, 9-Cannula, 10-Pipes, 11-Motor of pump, 12-Bulb let, 13-Antenna, 14-Power switch; (b) a chart of the remote control: 1-Cover, 2-Battery (9 volt), 3-Control switch, 4-Power switch, 5-Power light, 6-Antenna, 7-Transmitter; (c): the RBS device (modified); (d) Remote Control

Hormonal Assay: The serum testosterone and cortisol levels of all animals were determined in the bio-molecular laboratory of the College of Biotechnology at the University of Al-Qadisiyah using the enzyme-linked immunosorbent assay (ELISA) in adult male camels, validated and accredited by male dromedary camel's serum (all samples were analyzed in duplicate). The results were then expressed in ng/ml

in which both kits (MyBioSource Company, TESTO Elisa kit, Camel Testosterone ELISA Kit - MBS107991 and CORT Elisa kit, Camel Cortisol ELISA Kit-MBS082766/USA) were also processed, according to the manufactory protocol.

Statistical Analysis: All the values were expressed as mean ± standard error (SE) and subjected to analysis using two-way analysis of variance (ANOVA). The significance level among different parameters was calculated at $p<0.05$. The software used was the IBM SPSS program package (Version 23)[14].

Results

First Experiment: The findings revealed that the mean±SE of the serum testosterone concentration in pre-mating, mating, and post-mating periods were 14.1438±0.5833, 26.2675±0.8523, and 24.037±1.0071 ng/ml of; respectively, yet the serum cortisol in these periods were 44.8725±5.0133, 32.4775±1.9738, and 40.7688±3.0897 ng/ml; respectively (Table 1 & Figure 2).

Second Experiment: Using the RBS device, the concentration values of the serum testosterone concentration were reported by 16.8925±0.7008, 32.8563±1.3292, and 29.8519±1.0736 in pre-mating, mating, and post-mating periods respectively. However, the means of serum cortisol concentration in three periods, such values were 30.1918±3.0299, 21.4425±1.8629, and 22.4013±1.8645 ng/ml; respectively (Table 1 & Figure 2).

Table 1: Concentrations of testosterone and cortisol hormones (ng/ml) using the manual method and the RBS device in three periods for fifteen samples.

Periods	Testosterone (Mean±SE)*		Cortisol (Mean±SE)	
	Manual	RBS device	Manual	RBS device
Pre-mating	14.1438±0.5833 ^{Aa}	16.8925±0.7008 ^{Ba}	44.8725±5.0133 ^{Aa}	30.1918±3.0299 ^{Aa}
Mating	26.2675±0.8523 ^{Ab}	32.8563±1.3292 ^{Bb}	32.4775±1.9738 ^{Ab}	21.4425±1.8629 ^{Bb}
Post-mating	24.037±1.0071 ^{Ab}	29.8519±1.0736 ^{Bb}	40.7688±3.0897 ^{Aa}	22.4013±1.8645 ^{Bb}

*mean±Stander Error (mean±SE), ^{A,B}Difference within a row ($p<0.05$), ^{a,b}Difference within a column ($p<0.05$).

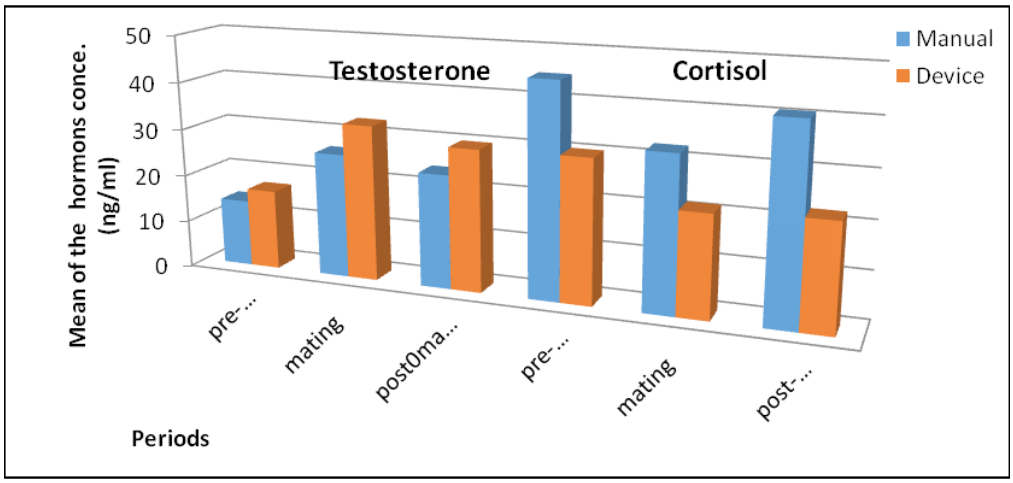


Fig. 2: Patterns of serum testosterone & cortisol concentrations in camels (ng/ml) suing the manual method and the RBS device. Significant differences were indicated ($p<0.05$) in mean comparisons between the three periods

Discussion

The present data obtained from the manual method of blood sampling (first experiment) indicated that the serum testosterone level increased in the mating time compared with those in the pre-mating and post-mating ones (Table 1 & Figure 2). The given rise may be due to

interactions with libido in male camels, these findings were in agreement with Aubè et al[15]. The testosterone hormone acting as a positive regulator of sexual desire has been also reported in many animals like horses, camels[15], monkeys[16] and in humans[17]. that were confirmed by studies of Goldey and Van Anders[18] in which recorded decrease the testosterone level in men had led to reduced libido; moreover, increase in the activity of enzymes synthesizing the testosterone hormone was greater in the breeding than the non-breeding season [19]. The activation of the hypothalamus-pituitary-adrenal axis and this can lead to a suppression of luteinizing hormone release because of the dysregulation of homeostasis (stress) and triggers an adaptive stress response [20]. Our study results were discrepancy with concluded of Exton et al [21] that orgasm in humans did not acutely affect testosterone levels in the blood. It was also argued that sex in men did not have any effects on testosterone levels but rather it could positively influence the production of testosterone [22]. Yet, a statistically significant increase in serum testosterone concentration in our study during mating time by using both sampling method were in consonance with those experiments in men in which plasma levels of testosterone were compared and examined before and after mating periods, yet in the second experiment, the RBS device as another method employed for blood collection which was applied on the same camels after one day following the first experiment to record the results in the same periods of libido. These findings confirmed the relationship between testosterone hormone levels and mating efficiency. On the other hand, the concentration of this hormone was highly significant ($p<0.05$) in a way that it had elevated greater compared with the manual method (Table 1 & Figure 2), The manual method might have caused stress or fear in animals, so the mean testosterone level in the pre-mating, mating and post-mating periods were significantly lower than those in the second experiment. The reason for given elevation was significantly reduced tension, stress, and fear in animals induced by veterinarians. So, the withdrawal of blood in routine method by syringe or cannula may lead to the secretion of some hormones like cortisol, that may cause a reduction of secretion in the testosterone hormone during intercourse. That testosterone hormone could influence libido in male camels. According to Peeters et al [23], one needs to assess the stress state when measuring free cortisol in serum. In this regard, the cortisol hormone level was elevated in all three periods using the manual method compared with the second experiment in which this level had declined because cortisol had been increased in response to physiological stress and fear which was in line with studies such as Chen et al, [24], Erickson et al [25]. According our result, we suggested the cortisol can be blocked by the testosterone actions and cause less testosterone which influences behaviors like mating since, but finding of Tajik et al [5] it was argued that the serum cortisol did not change significantly due to stress in the sheep and cattle; however, yet Chen et al [24] showed a significant increase which did not consistently change. The findings of this study were in line with other research investigations like Gordon et al [26] in which it was indicated that there were numerous interactions between stress and reproductive functions, and stress lead to stimulation of the hypothalamic-pituitary-adrenal axis might have reduced fertility in horses, caused by stress. In addition to the cortisol hormone in most mammals as well as fish and amphibians, corticosterone in reptiles and birds also plays an important role in all stasis as they are involved in the regulation of the hypothalamic-pituitary-adrenal axis [27].

Conclusion

There was a statistically significant difference between the concentrations of the testosterone hormones during the mating period and intercourse. Using the RBS device which led to reduced cortisol concentrations, the testosterone levels increased. These findings might be due to the withdrawal of blood remotely which could cause a reduction of excitement in animals using the manual blood sampling at the presence of veterinarians, so it was considered as an ideal method to measure hormonal concentrations, especially in experiments which need accurate results.

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required.

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Hyaluronidase Versus Magnesium Sulphate as Adjuvants to Bupivacaine in Ultrasound Guided Supraclavicular Brachial Plexus Block in Upper Limb Surgeries

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Abstract

Background: Aim of this trial was to assess the effect of hyaluronidase and MgSo4 when added separately or in combination to bupivacaine on the onset of sensory and motor block, quality of block and effect on duration of action.

Method: Eighty ASA I, II patients of either sex undergoing upper limb Surgery under ultrasound-guided supraclavicular brachial block were recruited in this prospective randomized double blinded controlled study and divided in to four groups each group contain 20 patients. First group received (28 ml 0.5% bupivacaine and 2 ml 0.9% normal saline). Second group received (28 ml 0.5% bupivacaine and 1000 unit hyaluronidase dissolved in 2 ml 0.9% normal saline). Third group received (28 ml 0.5% bupivacaine and 2 ml of MgSo4 containing 200 mg). Fourth group received (28 ml 0.5% bupivacaine and 2 ml of MgSo4 containing 200 mg mixed with 500 unit hyaluronidase).

Results: Hyaluronidase fastened the onset but didn't affect the duration however MgSo4 prolonged the duration of postoperative analgesia without effect on the onset of block

Keywords: *Regional, brachial plexus; local anesthetics, bupivacaine, equipment, ultrasound machines; hyaluronidase; MgSo4.*

Introduction

Supraclavicular nerve block is ideal for procedures of the upper arm, from the mid humeral level down to the hand. It has a rapid onset, with a dense and predictable level of pain control [1].

Hyaluronidase, the mucolytic enzyme which acts on the muco-polysaccharide hyaloronic acid, is generally considered to be "spreading factor". When used with local anesthetics, hyaluronidase hastens the onset of analgesia and shortens its duration of effect[2].

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Magnesium sulphate acts as an adjuvant in analgesia due to its properties of calcium channel blocking and N-methyl-D-aspartate antagonism. Magnesium has been shown to decrease peripheral nerve excitability and to enhance the ability of lidocaine to raise the excitation threshold of A-beta fibers[3].

Ultrasound guidance has dramatically improved nerve localization and offers several advantages as direct visualization of nerves and anatomical structures, facilitated visualization of local anesthetic spread in real time, produced good compensation for anatomical variation, reduced incidence of complications[4].

Method

This prospective, randomized, double blind controlled clinical study was carried out after obtaining the local ethics committee of El-Minia university hospital approval and written informed consent was taken from the patients. It was done between September

2017 to December 2018, 90 patients of both sexes, ASA I and II, aged between 18-65 years old scheduled to undergo elective and urgent distal arm, forearm and hand surgeries under ultrasound guided supraclavicular brachial plexus block, 80 patients were enrolled in this study and ten were excluded due to block failure.

Preoperative assessment and preparation: A careful assessment of medical history was done. Routine preoperative general examination and local examination of the site of injection for signs of infection or any other pathology were carried out. Routine investigations were done. Explanation of visual analogue pain scale was done VAPS is consisted of a straight, vertical 10-cm line; the bottom point represented "no pain"= (0 cm) and the top "the worst pain you could ever have. Two mg midazolam IV was given as a premedication 5 minutes before the block.

Equipment: The ultrasound device Sonosite, micromaxx, Lubricating gel, 21-gauge 50 mm length short bevel insulated stimulating needl, 10-ml syringes for injection, Sterile gloves, 25-gauge needle for skin infiltration, Sterile towels and sterile antiseptic solution (Povidone-iodine 10%).

All medications were prepared in similar sterile coated bottles and coded then passed to the anesthesiologist who is blind to its manner. In this prospective randomized double blinded controlled study 80 bottles numbered from 1 to 80 were prepared and divided in to four groups each group containe 20 bottles. Then the patients were randomly assigned to study groups.

Group (I): Received 28 ml bupivacaine (0.5%) + 2 ml saline (0.9%).

Group (II): Received 28 ml bupivacaine (0.5%) + 1000 unit hyaluronidase dissolved in 2 ml saline (0.9%).

Group (III): Received 28 ml bupivacaine (0.5%) + 2 ml MgSo4 containing 200 mg.

Group (IV): Received 28 ml bupivacaine (0.5%) + 2 ml MgSo4 containing 200 mg mixed with 1000 unit hyaluronidase.

Block Technique: A 20 G intravenous cannula was inserted in a peripheral vein of unaffected upper limb and standard monitoring was provided. Patient lie down supine with head turned to the contralateral side and ipsilateral arm adducted gently by the assistant. Skin was sterilized and infiltrated with 1-2 ml of lidocaine 2% at the needle entry site.

The brachial plexus was visualized by placing ultrasound probe in the sagittal plane in the supraclavicular fossa behind the middle-third of the clavicleas 3 hypoechoic circles with hyperechoic outer rings or as a grape like cluster of 5 to 6 hypoechoic circles, lateral and superior to the subclavian artery between the anterior and middle scalene muscles at the lower cervical region.

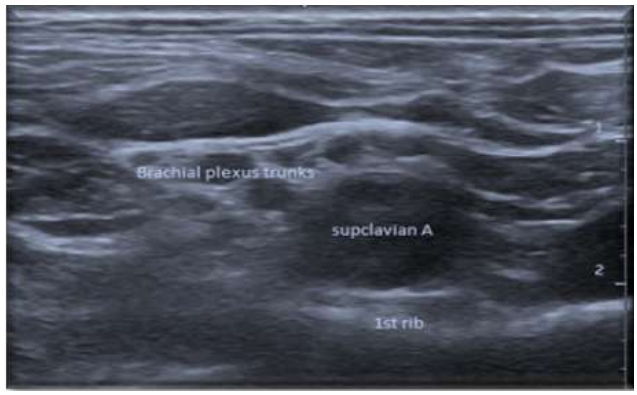


Fig (1): Ultrasonographic imaging of brachial plexus

Parameters Assessed: The anesthesiologist who gave the block recorded the onset of sensory and motor block and recorded intraoperative data then the postoperative care physician recorded the duration of block and postoperative data.

The hemodynamic variables were assessed and recorded 5 minutes before the block as a baseline value, immediately after the block 0,10,20,30,60, 90 minutes during the operative time then 1,2,4,6, and 12 hours after the end of operation. Quality of sensory block was assessed by pin prick test using a 3-point scale [5] Grade 0 = normal sensation, Grade 1 = loss of sensation of pin prick (analgesia), and Grade 2 = loss of sensation of touch (anesthesia).

Also motor block quality was determined by thumb abduction (radial nerve), thumb adduction (ulnar nerve), thumb opposition (median nerve), and flexion of elbow (musculocutaneous nerve) according to the modified Bromage scale 1997 [6] on a 3-point scale. **Grade 0:** Normal motor function with full flexion and extension of elbow, wrist, and fingers. **Grade 1**: Decreased motor strength with ability to move the fingers only. **Grade2:** Complete motor block with inability to move the fingers.

Pain intensity was assessed using **VAPS**. It was

measured before starting the nerve block then 15, 30, 60, 90, 120 minutes after nerve block. When it is more or equals 4 cm we gave analgesia or sedation using fentanyl and propofol during operation. Then Patients were asked to rate their pain intensity at 2, 4, 8, 12, and 24 hours postoperative and if it was more than four paracetamol 1000 mg bottle was given. Time of first analgesic request: The time from supraclavicular brachial plexus block administration to the patient's first request for analgesic medication by hours. Total analgesic requirements in 24 hours: The total amount of intravenous paracetamol which was given to the patient as a rescue analgesia or maintenance during 24 hours. Adverse effects: any adverse effects such as hypotension (i.e. 20% decrease relative to baseline), bradycardia (HR <50 beats/min), nausea, vomiting, hypoxemia (SpO2 <90%),local hematoma, hemothorax, pneumothorax,recurrent laryngeal nerve block, intravascular injection, Horner's syndrome and signs of local anesthetic toxicity were recorded during the operation and for 24 hours postoperative.

Results

During studying hemodynamic data changes among groups, The Mean Arterial blood pressure (mmHg) and arterial oxygen saturation changes during intraoperative or postoperative period were statistically insignificant between the four groups. As regard the Heart rate (beat\ min) we found it was lower in group (II, IV) than the other two groups (I, III) at time intervals of 10,20,30 and 60 minutes intraoperative but these changes were statistically insignificant.

Sensory, motor block onset and density of block were faster in groups (II & IV) than in groups (I & III) but the duration of sensory and motor block was found to be longer in groups (III & IV) than in groups (I & II) as presented in fig (2, 3, 4).

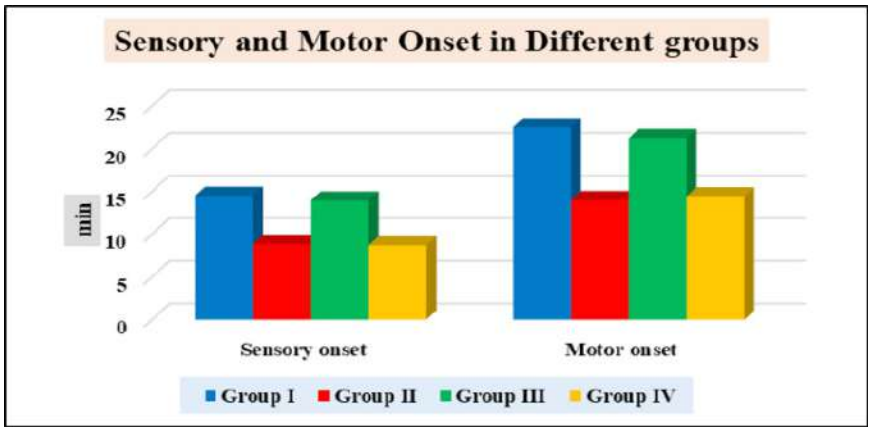
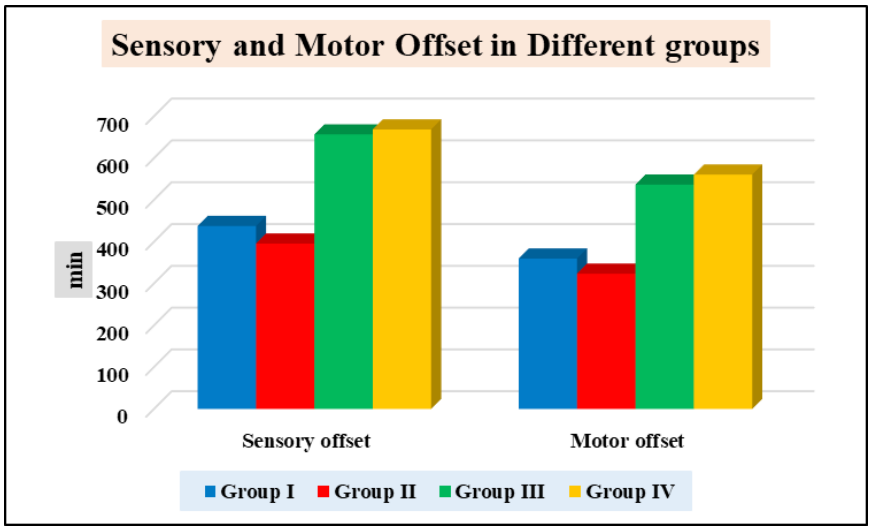


Fig (2)



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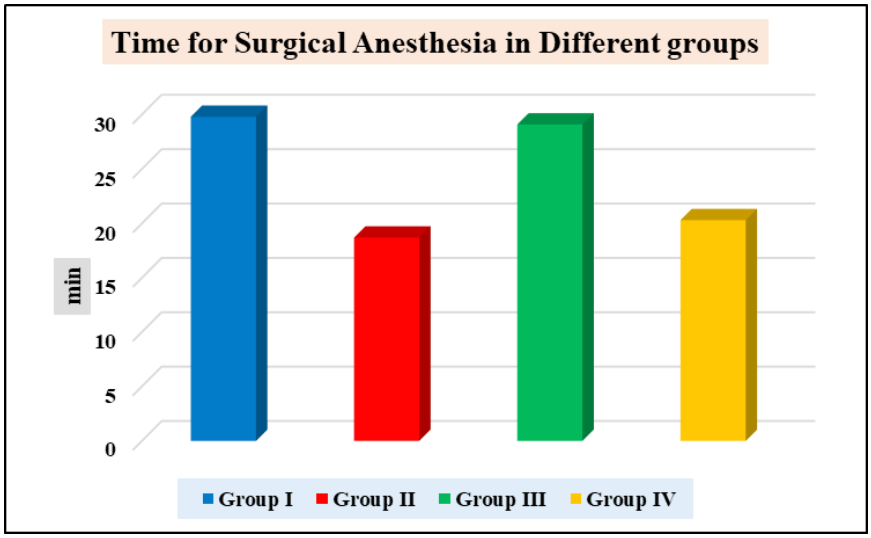

Fig (4)

Pain measurement presented by VASP during intraoperative period at 15 min post injection the pain score was significantly lower in patients received hyaluronidase in groups (II & IV) than in groups (I & III) but no significant difference was found after that during operation. In the postoperative period the VASP was significantly lower at 4, 8, 12, 24 hours in patients received MgSo4 in groups (III & IV) than in groups (I & II).

Intraoperative need for sedation and fentanyl was insignificantly different between the four groups. But the mean time of for postoperative 1st analgesic (minutes) request was significantly longer in groups (III & IV) (360-900) and (540-950) minutes in comparison to groups (I & II) (300-620) and (300-700) minute. And total analgesic requirement (mg) in groups (III & IV) was less than groups (I & II).

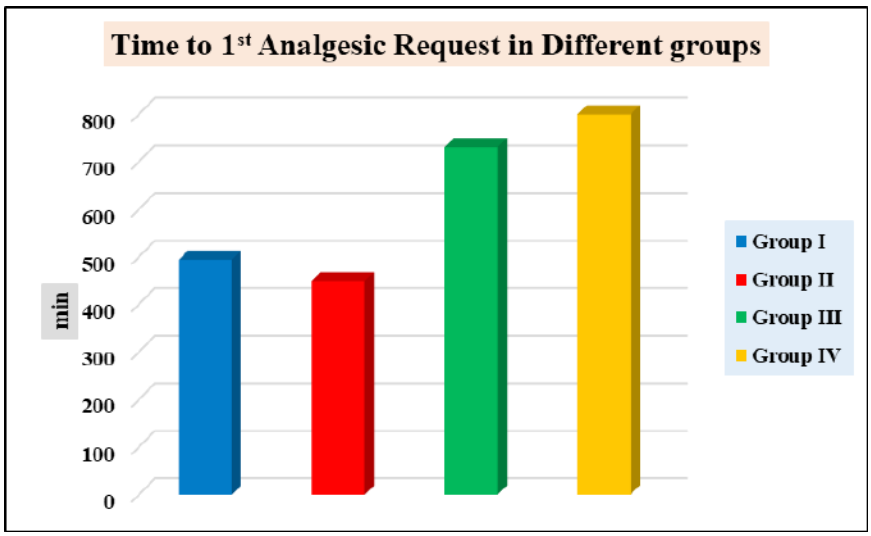

Fig (5)

As regard complications happened during the study no significant differences were found between the four groups.

Discussion

Brachial plexus block is a safe reliable anesthetic technique for upper limb surgery with fewer

complications, especially with the introduction of ultrasound which decreased the complications dramatically.

Hyaluronidase, the mucolytic enzyme which acts on the muco-polysaccharide hyaloronic acid, is generally considered to be "spreading factor". When used with local anesthetics, hyaluronidase hastens the onset of analgesia and shortens its duration of effect [7].

A number of studies have shown that addition of hyaluronidase during ocular blocks has beneficial effects including higher quality of anaesthesia and improved success rates.

In a study done by **Koh et al** investigated the hypothesis that addition of hyaluronidase to ropivacaine may reduce the time to achieve complete sensory block after axillary brachial plexus block. The patients were randomly assigned into a hyaluronidase group (n = 24) and a control group (n = 24). The hyaluronidase group received ropivacaine 0.5% with 100 IU.ml_1 of hyaluronidase, and the control group received ropivacaine alone. The primary endpoint was the time to achieve complete sensory block. The hyaluronidase group demonstrated significantly shorter mean (SD) sensory block onset time **(13.8 (6.0) min)** compared with the control group **(22.5 (6.3) min),** $p < 0.0001$). Addition of hyaluronidase to ropivacaine resulted in a reduction in the time needed to achieve complete sensory block [8].

Another previous study by **Keeler et al** reported the effect of the addition of hyaluronidase to bupivacaine 0.5% for axillary brachial plexus blocks. In that study, 3000 IU hyaluronidase mixed with bupivacaine significantly reduced the duration of the sensory and motor block, and had no effect on the number of patients experiencing a complete sensory block after 30 min while the duration of sensory anesthesia was significantly shorter in the hyaluronidase group and the duration of motor block showed a shorter trend [9].

In our study hyaluronidase had obvious effect on decreasing the sensory onset that recorded by pinprick test at 5 min interval after performing the block till complete sensory block occurred and motor onset detected by detection of complete thumb block also detected at 5 min interval after the block in comparison with control group and Mgso4 group. The mean sensory onset was (8.9 ± 3.3) minutes in hyaluronidase group in comparison to the mean sensory onset (14.5±4.5), (14± 3.8) minutes in control and Mgso4 groups respectively. The mean motor onset was (14±5.1) minutes in hyaluronidase group in comparison to the mean motor onset (22.5±4.9), (21.3±5) minutes in control and Mgso4 groups respectively, and both results were significant with p value < 0.001. However it didn't affect the duration of sensory or motor block or the postoperative analgesic requirement in comparison with other groups.

Mgso4 can act as an adjuvant in analgesia due to its properties of calcium channel blocking and N-methyl-D-aspartate antagonism. Magnesium has been shown to decrease peripheral nerve excitability and to enhance the ability of lidocaine to raise the excitation threshold of A-beta fibers [10].

Haghighi et al. in Guilan, Iran, in 2014, investigated the effect of Mgso4 in axillary brachial plexus block when added to lidocaine in upper limb surgeries, and reported that the addition of Mgso4to lidocaine significantly increased the duration of sensory and motor blocks in comparison with the use of lidocaine alone [11].

Rao et al, found thatThe addition of MgSo4 to 0.5% bupivacaine increased the duration of motor and sensory supraclavicular brachial block in the upper extremities during surgeries when compared to the use of 0.5% bupivacaine alone,The mean sensory block duration in the group MgsSo4 was 249±9.36 and in control Group was (160±5.62) (p<0.39). The mean motor block duration in the group MgsSo4 was (232±9.64) and in control group was (147±26.52) (both p<0.32). The mean onset of sensory block in group MgsSo4 was (15.5±2.16) and the onset of block in control group was (12.73±1.18) (p<0.4) statistically not significant). Alsothe mean onset of motor block in group Mgso4 was (23.5±1.1) and the onset block in control Group P was 41±3 (p<0.53; statistically not significant) [12]

In our study the addition of Mgso4 to 0.5% bupivacaine in supraclavicular brachial plexus block for upper limb surgeries increased the duration of sensory and motor blocks with mean sensory block duration (643.1±144.8) in Mgso4 group vs (423.5±89.4) in control group or (387.2±78.3) in hyaloronidase group and mean motor block duration (546.6±99.8) vs (337.5±77.6) in control group or (310±84.9) in hyaloronidase group with (p value <0.001) for both. Also Mgso4 decreased the postoperative pain with mean VAPS at 4, 8, 12, 24 (0-2.8), (0-3), (2-6), (5-6) vs (2-3), (4-6), (6-7), (7-7.8) in control group vs (2-3), (3.3-6), (6-7), (6-7.8) with (p value <0.001) for all. Also Mgso4 reduced total

analgesic requirements in comparison with the use of 0.5% bupivacaine or bupivacaine plus hyaluronidase with mean total analgesic requirement (1-2) in Mgso4 vs (2-3) in both control and hyaluronidase groups and the change was statistically significant with (p value <0.001). However MgSo4 didn't affect the onset of sensory or motor block when compared to the control and hyaluronidase group.

The most recent in our study is the addition of both MgSo4 and hyaluronidase to bupivacaine 0.5% which resulted in significant decrease in the onset of motor and sensory block and also significant increase in the duration of the block which produced rapid surgical anesthesia, reduced postoperative pain and decrease postoperative analgesic requirement, the mean sensory block onset was (8.7±2.7), the mean motor block onset was (14.5±4).mean VAPS at 4, 8, 12, 24 hours was (0-0), (0-2), (2.3-5), (5-6) which was significant in comparison with control and MgSo4 groups with p value < 0.001. Mean sensory duration was (660.3±94.9), Mean motor duration was (546.6±99.8) both was significantly increased than control and hyaluronidase groups with p value < 0.001. Mean total postoperative analgesic request was (1-1.8) also it was significantly less than control and hyaluronidase groups.

Conclusion

The present study shows that the use of hyaluronidase reduces the time to reach complete sensory and motor block and therefore shortens the total anesthetic time before operation, hyaluronidase has no influence on the total analgesic duration or the consumption of postoperative analgesics.

Also the study shows that the use of Mgso4 increases the duration of motor and sensory block, increases the analgesic duration and reduces the postoperative analgesic consumption. However MgSo4 has no effect on the sensory or motor onset of block.

Last conclusion was that the combination of both MgSo4 with hyaluronidase as adjuvants to bupivacaine produces significant effect on reducing the time to reach complete sensory and motor block and therefore shortens the total anesthetic time before operation, increases the duration of motor and sensory block, increases the analgesic duration and reduces the postoperative analgesic consumption.

The Institutional Ethics Committee approved this study of the School of Medicine, Minia University, Egypt, and all patients gave informed consent before participation in this study. The study conducted in accordance with the ethical guidelines of the 1975 Declaration of Helsinki and International Conference on Harmonization Guidelines for Good Clinical Practice.

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Influence of Social Cultural Capital and Marketing on Skin Whitening Products Use among Higher Education Female Students in the Northeast of Thailand

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Abstract

Introduction: There have been increasing trends of skin whitening products use globally. Social cultural capital has been identified as one of a significant determinants of skin whitening products use. However, there was no study on these issues in Thailand. Therefore, this study aimed to identify skin whitening products use situation and the association between social cultural capital, marketing, and skin whitening products use among female higher education students in the Northeast of Thailand.

Method and Materials: This cross-sectional study was conducted in the Northeast of Thailand among 1,143 female higher education students. Data was collected using a self-administered structured questionnaire. The Generalized Linear Mixed Model (GLMM) was used to identify the associations between social cultural capital, marketing and skin whitening products use when controlling other covariates.

Results: Most of the respondents ever used skin whitening products (84.95% : 95% CI: 82.88–87.03), of which 52.66% (95% CI: 49.77–55.57) were current users, and 17.41% (95% CI: 15.21–19.61) were inappropriate use. The social cultural capital factor that were associated with skin whitening products use were those who were not satisfied with skin colors (Adj. OR=3.48; 95% CI=2.18–5.55; p<0.001), had friends using skin whitening products (Adj. OR=2.63; 95% CI=1.71–4.04; p<0.001, had thin to normal figures (Adj. OR=2.53; 95% CI=1.54–4.15; p<0.001), and had family members using skin whitening products (Adj. OR=1.86; 95% CI=1.10–3.15; p=0.020), studied in humanities and social sciences (Adj. OR=2.07; 95% CI=1.25–3.45; p=0.005) and product marketing (Adj. OR=1.92; 95% CI=1.15–3.20; p=0.012). Moreover, other factors that were also associated with skin whitening products use were family monthly income.

Conclusion: Majority of the higher education female students were current skin whitening products users of which about one-sixth was inappropriate users. Both social cultural capital, marketing had influence on skin whitening products use.

Keywords: *Skin whitening, Social cultural capital, Marketing, Female students.*

Introduction

Skin whitening products use is an ancient and widespread practice in many cultures[(1)], and is one of the most popular products of the global beauty industry, particularly in Asia. Marketing forecasters predict the business will be worth about USD 31.2 billion by 2024[(2)]. In several Asian countries, particularly India, Japan, Korea, China, and Thailand, women face pressure to lighten their skin due to the social perception that light skin is considered to be a cultural marker of beauty, class, and wealth, and has been reflective of high social status for many decades[(3-4)]. The social cultural capital refers to social, political, economic, cultural assets, and imperceptible health resources[(5-6)],

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with a growing recognition of the socioeconomic status and social determinants of health[7]. It has been described as a feature of trust, norms, networks, skill, cultural knowledge, and education that can improve the efficiency of society by facilitating coordinated actions[8]. In addition, previous studies reported that the advertising industry has recently created a market on notions of beauty, and enhance social cultural capital for the improvement in confidence and career prospects through the use of products advertised to promote white skin[9].

However, skin whitening products frequently contain toxic ingredients that are directly associated with adverse health and skin problems [10]. A study on the use of skin whitening products among university students indicated that 70.7% of females reported using skin whitening products [11] of which their use was associated with adverse skin effects, lack of personal control, risky sexual behaviors, and low social support [12]. In Thailand, as well as the Northeast region, the country biggest region both in term of land areas and population, there are still lack of research specifically concerned with social cultural capital, skin whitening products use, and their relationship to female higher education students.

Hence, this study aimed to describe skin whitening products use situation and to identify the association between social cultural capital, marketing, and skin whitening products use among female higher education students in the Northeast of Thailand. The findings of this study will provide evidence for health, education and relevant sectors to formulate appropriate measures to improve inequalities in health and reduce the use of skin whitening products.

Method

This cross-sectional analytical study was conducted between March to July 2019. The population were female higher education students in the Northeast of Thailand. The inclusion criteria were female higher education students aged 18 years old and older, currently studying for a bachelor's degree in universities of the Northeast of Thailand, able to verbally communicate, and agreed to participate in the study with written informed consent. The sample size was calculated by using the formula to estimate the sample size for a logistic regression analysis of Hsieh [13]. The estimated sample size was 1,143. We recruited students from 18 universities of the Northeast by using a multi-stage random sampling method. The sampling frame was all 18 universities in the Northeast of Thailand. The first stage was a random selection of 4 universities, followed by randomly selecting 3 fields from each university. Then, one faculty from each field was randomly selected. Therefore, a total of 12 faculties were included in the study. Simple random sampling was applied to select participants proportional to the size of the estimated total samples. A total number of 1,143 individuals were chosen to participate in this study.

Research Tools: A structured questionnaire was developed based on the research questions and relevant literatures. The structured questionnaire consisted of 4 parts including: 1) Demographic and socioeconomic: age, university level, field of study, residence, allowance, family monthly income, adequacy of expense, and family members. 2) Skin whitening products use included; Have you ever used skin whitening products in your lifetime? Do you currently use skin whitening products? Inappropriate use was assessed by using a list of dangerous cosmetics from the FDA (Food and Drug Administration, Ministry of Public Health, Thailand), defined as those who reported any use of dangerous cosmetics. 3) Social cultural capital included; satisfied with skin color, have a friend using skin whitening products, have any family members using skin whitening products, Figures were assessed by using BMI (Body Mass Index). The scores were categorized into four groups according to the WHO (World Health Organization) [14] for Asian-Pacific cutoff points, as follows: Underweight (<18.5 kg/m^2), Normal (18.5–22.9 kg/m^2), Overweight (23–24.9 kg/m^2), and Obese (≥25 kg/m^2). Finally, the scores were dichotomized as thin/normal (<23) and overweight/obesity (≥23). 4) Marketing: Product, Price, Place, and Promotion. Using the 5 scores (Very Low, Low, Moderate, High, Very high). After summing up the total marks, according to Best's theory, the scores were categorized into 3 groups (Low, Moderate, High). Finally, the scores were dichotomized as low/moderate (<3.68) and high (≥3.68) by using the mean as the cutoff point.

The questionnaire was undergone content validation by 5 experts and was revised to improve its validity. The Cronbach's alpha coefficient of social cultural capital was 0.80, marketing was 0.87. A self-administer questionnaire was used for data collection. The researcher responded to possible questions raised by the respondents, and assisted them when necessary. The completed questionnaires of each student were placed

into an individual envelope, sealed, and put into a box. Confidentiality of all data was fully assured.

Data Analysis: The data was analysed using STATA® (ver. 13; College Station, TX, USA: Stata Corp). Frequency and percentage were presented to describe the categorical variables. Continuous variables were described as mean and standard deviation, median and range. The generalized linear mixed model (GLMM) was performed to model the random effects and correlations within clusters. In the modelling, the universities were set as random effects. Bivariate analysis was used to determine the association of each independent variable with skin whitening products use. The variable that had p-value<0.25 were proceeded to multivariable analysis, of which the backward elimination method was used for model fitting. The final model results were presented as adjusted Odds Ratio (Adj. OR), 95% CI, with the levels of significance of 0.05.

Results

The average age of female higher education students was 20.67 ± 1.25 years old. Almost equal proportion of students were form each 4 universities (about 25%) and were from freshman (24.06%), sophomore (24.41%), junior (27.91) and senior: 23.62%. Majority of the student lived in private accommodation. Their median family monthly income was USD 940 with the ranged of USD 163 to USD 6,528. Nearly half of the respondents had adequate financial support but were unable to save any money. Most of respondents (84.51%) had thin and normal figure, and had friends (71.22%) using skin whitening products. Almost one-third had family members using skin whitening products and were not satisfied with their skin colors. Majority of respondents (53.81%) perceived a moderate level of overall marketing strategies and about 60% perceived a high level of product marketing.

Most of the respondents used skin whitening products (84.95%), 52.66% were current use and 17.41% were inappropriate use.

Table 1: Number and percentage of skin whitening products use among female higher education students in the Northeast of Thailand (n = 1,143)

Characteristics	Number	Percent	95% CI
Use of Skin Whitening Products			
Never	172	15.05	13.09 – 17.24
Ever	971	84.95	82.76 – 86.91
Current Use			
No	541	47.34	44.44 – 50.24
Yes	602	52.66	49.76 – 55.56
Inappropriate Use			
No	944	82.59	80.28 – 84.68
Yes	199	17.41	15.32 – 19.72

The bivariate analysis indicated that social cultural capital factor including satisfied with skin colors, had friends using skin whitening products, figures, had family members using skin whitening products, and field of study, product marketing and marketing on place, age, family members, family monthly income, and allowance might associated with skin whitening products use (p-value <0.25). These variable were proceeded to the multiple variable analysis using GLMM. The results indicated that satisfied with skin colors (adj. OR=3.48: 95% CI; 2.18-5.55), had friends using skin whitening products (adj. OR= 2.63: 95% CI; 1.71- 4.04), were thin-normal (adj. OR= 2.53: 95% CI; 1.54- 4.15), studied in the field of humanities and social sciences (adj. OR= 2.07: 95% CI; 1.25- 3.45), had product marketing level (adj. OR= 1.92: 95% CI; 1.15- 3.20), and had monthly family income ≥ 980 USD (adj. OR= 2.13: 95% CI; 1.41- 3.20)

Table 2. Factors Associated with Skin Whitening Products Use among Female Higher Education Students: A multivariable analysis (n = 1,143)

Characteristics	N	% of Use	OR	AdjOR	95% CI	p-value
Satisfied with skin colors						**<0.001**
Yes	618	81.42	1	1		
No	353	91.93	2.60	3.48	2.18 –5.55	
Had friends using skin whitening products						**<0.001**
No	226	68.69	1	1		
Yes	745	91.52	4.92	2.63	1.71 – 4.04	

Characteristics	N	% of Use	OR	AdjOR	95% CI	p-value
Had family members using skin whitening products						**0.020**
No	591	80.19	1	1		
Yes	380	93.60	3.61	1.86	1.10 – 3.15	
Figures						<0.001
Overweight-obesity	136	76.84	1	1		
Thin-normal	835	86.44	1.92	2.53	1.54 – 4.15	
Field of study						0.005
Sciences and Technology/Health						
Sciences	278	82.74	1	1		
Humanities and Social						
Sciences	693	85.87	1.27	2.07	1.25 – 3.45	
Product marketing						0.012
Low-moderate	380	81.02	1	1		
High	591	87.69	1.67	1.92	1.15 – 3.20	
Family monthly income						<0.001
< 980 USD	464	80.70	1	1		
≥ 980 USD	507	89.26	1.99	2.13	1.41 – 3.20	

Discussion

Skin whitening products use among female higher education students was 84.95%. This finding is consistent with previous studies reporting a high prevalence of skin whitening products use [1,15]. However, this was inconsistent with a study among African women, observed only 60% the respondents using skin whitening products [16]. Our study observed that 52.66% of students were current users, which was higher than the 37.60% found in India. It probably due to the greater range of ages (16-60 years) as well as the cultural setting of the study [17]. About one sixth were using the products inappropriately, a little lower than 46.7% of teenage females reported using harmful cosmetics [18].

The multivariable analysis of this study confirmed that social cultural capital was significantly associated with skin whitening products use. Regarding social cultural capital and satisfaction with skin colors, students who were dissatisfied with their skin colors were 3.48 times more likely to use skin whitening products. This finding was consistent with a previous study [15]. Social and cultural notions connected females using skin whitening products[15]. The presence of social cultural capital among university students was associated with their entire health and individual life [19]. Shroff, H et al suggested enhanced social cultural capital for prevention of use among women[17]. Students who had friends using skin whitening products were 2.63 times more likely to use skin whitening products as well as having family members using skin whitening products were 1.86 times more likely to use them. It might be that both peers and families could have direct communication with the students that could have influence on their behaviors. These findings were consistent with another study [20]. Students with thin to normal figures were 2.53 times more likely to use skin whitening products compared to those in the overweight and obese group. This was in similar with the study in India [17], but inconsistent with the study in Sudan [15]. This might be due to the body image and beauty concerns of female students engaged in weight control. Students who studied in humanities and social sciences were 2.07 times more likely to use skin whitening products than students who studied science and technology. The finding was also consistent with another study [21]. Students with a high level of product marketing were 1.92 times more likely to use skin whitening products, which was similar with a study in United Arab Emirates [22]. Students with family monthly income ≥ USD 980 were 2.13 times more likely to use skin whitening products. This was also similar with a study conducted in Southeast Asia [19]. It might be that they had money to spend on nonessential items.

Conclusion

As high as 84.95% of the higher education female students ever used skin whitening products of which more than half were current skin whitening products

users. About one-sixth was inappropriate users. Both social cultural capital, marketing had influence on skin whitening products use.

Limitation of the Study: Since this is a cross-sectional study, it could not identify the causal relationship between independent variables with skin whitening products use.

Conflicts of Interest: The authors declare no conflicts of interest.

Ethics Clearance: After explaining the study objective, written informed consent was taken from all the participated in the study. Confidentiality of the data was fully assured. The Khon Kaen University Ethics Committee in Human Research approved the exemption for ethical approval of this study (reference no. HE 612343).

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Knowledge Management Based Performance Improvement on Certified Health Workers in Health Center of South Sulawesi

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Abstract

Introduction: The aim of this research was to determine the effect of Knowledge Management on improving the performance of health workers force at Primary Health Center of South Sulawesi.

Material and Method: The research used qualitative method. The informants were 12 health workers. Data collection used was in-depth interviews. The tools used were tape recorders and camcorders.

Finding and Discussion: This study found that the Knowledge Management method was relevant to be used in increasing the performance of health workers force in a group of health workers (Doctors, Nurses, Midwives, and SKM (Bachelor of Public Health) who come from different functional health positions) at the South Sulawesi Community Health Center.

Conclusion: Performance of health work force could be done using one method which was knowledge management.

Keywords: *Health workers force, Knowledge management, Performance.*

Introduction

Global Health Workforce Alliance (GHWA) Conference reported that the quality of Human Resources Health is still a problem at the global level. In Indonesia, various efforts to improve the quality of health human resources to achieve sustainable competitive advantage and increase profitability were carried out through education and training. However, the education and training system have been criticized for years. The quality of the results of education and training of health workers in general is still inadequate[1]. According to various studies showed that health workers are the main key in the success of achieving health development goals. Health workers contribute up to 80% in the success of health development. In 2006, WHO reported that Indonesia was one of 57 countries that faced a health HR crisis, both in number and distribution.

Competence is an ability possessed by someone in carrying out a task or a job based on skills and knowledge. The development of human resource competencies in the health sector is a strategic component of health development in order to accelerate the distribution of health services and the achievement of health development goals. The performance of an organization will be determined by one of the main elements, which is the quality of human resources[2].

The implementation of non-quality training will have an impact on the low competency of graduates which ultimately affects the performance of institutions/ organizations. According to Hendry, the practice of improving the quality of human resources (training, job design, employee skills, employee attitudes, work motivation, etc.) has an impact on the performance

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of various business units[3]. Likewise, Sule findings showed a significant positive relationship between competency-based training and development and employee performance[4]. Knowledge management is a concern of what is called Knowledge Management (KM). According to Qwaider, Knowledge Management helps manage knowledge individually or in group within organizations or between organizations that can affect the quality and benefits of knowledge[5].

Several studies were conducted on knowledge management related to variables such as performance, competence, training, learning, and others. Research conducted by Tongsamsi discovered the effect of knowledge management and training on manager competencies[6]. Knowledge management positively influences organizational performance. Another study was conducted by Chandavimol, which isthe development of a mixed training model by applying the principles of knowledge management and learning actions, in order to develop the design competency of health human resource development staff training programs in the government sector[7]. Furthermore, the working team will form collaboration between participants in education and training [8] . The aim of this research is to improve the performance of the health work force at the Primary Health Center of South Sulawesi. In the era of knowledge-based society in the 21st century, the way people learn has changed. New knowledge is gained by learning from training, work and exchange of experiences. The US Department of Labor estimated that more than 70% of knowledge occurs from experience and 30% from education and training[9].

Knowledge of each individual in the organization or the company is certainly different so it causes the knowledge does not develop evenly within the environment. Knowledge Management is one solution to assist knowledge processing, so that individuals in training or learning classes can have the same knowledge[9], then with the same knowledge it can help to develop an organization or company. Knowledge management is formed from a knowledge, where knowledge is divided into two types, those are Tacit Knowledge and Explicit Knowledge. This knowledge can be in the form of: books, journals, scientific works, references or others. This knowledge is obtained and developed from the content and information contained in it.

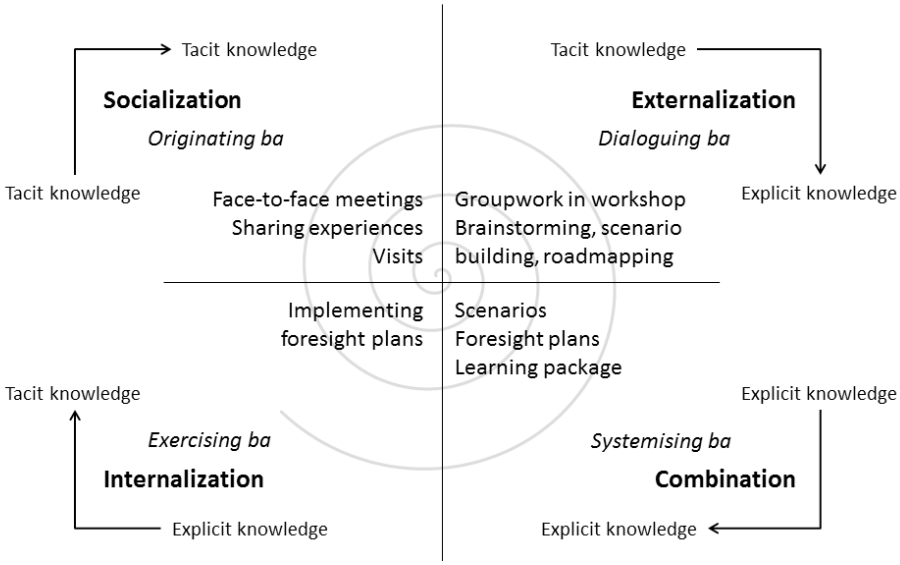

Figure 1. SECI Model

Figure 1 is known as the SECI Model[10], in the figure where there are two types of knowledge, those aretacit knowledge and explicit knowledge. In university education activities, knowledge management can improve administrative services related to the improvement of curriculum, teaching and learning processes usingtechnology, as well asimproving response by monitoring and combining lessons from student experience and evaluation[11]. Nawaz and Gomez, presented two Knowledge Management Model Concepts.

The first model concentrates on how knowledge sources are transformed into strategic knowledge, where the process of converting tacit and explicit knowledge into knowledge diffusion converts it again as the application of knowledge. Participants develop their knowledge by understanding the concept of subject matter and converting it into strategic knowledge. The second model strategic knowledge is a source of knowledge for students, while learning knowledge learners diffuse knowledge and choose strategic knowledge. This enhances procedural knowledge owned by the students, generates core subject skills and algorithms, core subject techniques and method as well as formula knowledge to determine when and how to use appropriate procedures to solve problems. The Strategic Knowledge Model can be implemented in universities, then for Knowledge Models can be implemented in advanced training institutions.

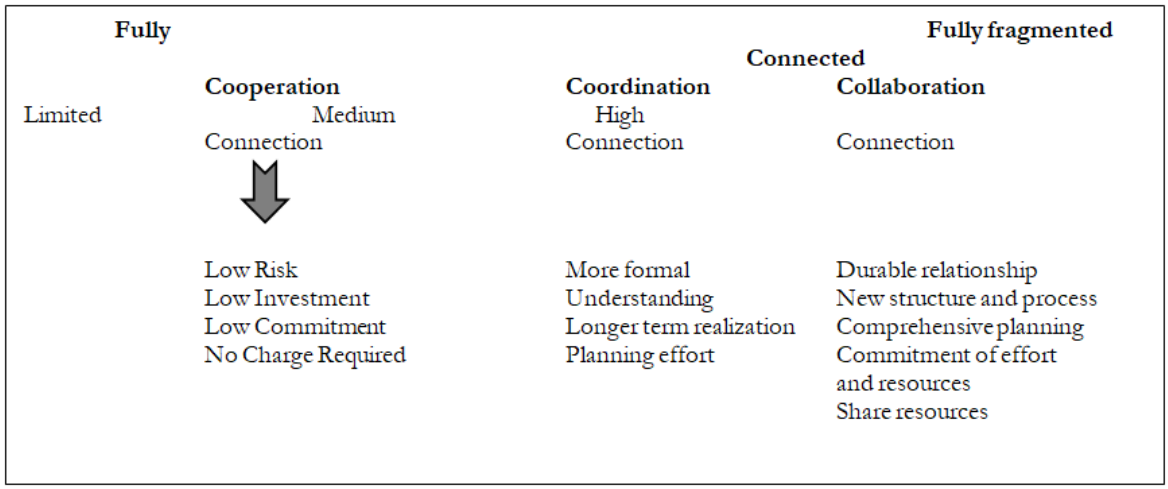

Figure 2. The Victorian council and social services

Knowledge Management strategy is very much needed to cooperate or collaborate, namely Cooperation, Coordination and Collaboration. Simple horizontal integration between cooperation, coordination and collaboration is shown in Figure 2.

Material and Method

Based on the conceptual framework, the variables in this study consisted of: Knowledge Management Strategy as an independent variable, and Enhancing Performance and competency as the dependent variable. This study used qualitative research method to obtain comprehensive, valid and objective data.

Finding and Discussion

The results of in-depth interviews showed that the application of knowledge management in the form of face-to-face socialization had a positive impact and benefits for the health workers in the Primary Health Center. Thus, it was very well implemented for every training attended by the health workers in the Primary Heath Center, since knowledge management is very helpful in understanding the management of the health center. In addition it is also able to be directly held.

Knowledge management can improve organizational performance[12] even though not all knowledge resources affect organizational performance directly. However, it cannot be ignored because they work in combination with other supporting sources, including knowledge acquisition and application knowledge that can contribute directly to the organizational success.

Based on the results of research at the Primary Health Center that have implemented knowledge management, it shows that it indirectly affects the performance of health workers so that it can encourage the management of the health center to improve the function of health services. The following are the results of the interview:

.....Socialization of training results improved performance, seen from the document management of the health center that had been produced.....

Performance is a work achievement that can be measured based on the standards or criteria set by the Primary Health Center. The completion of basic tasks and functions is the performance of a health worker who is physically and mentally attached.

.....At our place (Primary Health Center),every employee who participated inthe training must be trained to conduct socialization of training in meeting each patient in the Primary Health Center.....

Knowledge Management focuses on the identification, acquisition, distribution and maintenance of substantial and relevant knowledge. Rush (2005) described the term of Knowledge Management related to the exploitation and development of knowledge assets of an organization with the intention of improving the organizational goals. Knowledge management has been implemented in many organizations with the expectation that they will have a positive effect on performance [11].

Conclusion

The results showed that knowledge management had an effect on performance, and it could be concluded that health workers in the Primary Health Center who were committed to organizing had an impact on completing their main tasks and functions as health workers. Knowledge management provides development and the ability to think, work and manage work well so as to produce performance that affects the health services. Furthermore, research on learning strategies and knowledge management are suggested to be combined because they can facilitate the learning well.

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Determinants that Influence Relationship between Motivation and Job Satisfaction of Health Workers at Primary Health Care in Indonesia

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Abstract

Background: The result from first National Study in Indonesia showed motivation and job satisfaction of health worker was low. The objective of this study was to identify determinants factor that influence relationship between motivation and job satisfaction of health worker at PHC in Indonesia.

Method: This was an advance analysis of RISNAKES 2017, a crossed sectional study which conducted at PHC in Indonesia. The respondents were physician, dentist, nurse, and midwife. Structural Equation Modelling (SEM) was used for analysis the relationship.

Result: Total 402 health workers recruited from 302 at PHC in Indonesia and the model association was fit (Critical Ratio=8.057, p<0.000). Motivation was responsible for 51% variance of job satisfaction. "Length working at current PHC" was the only determinant relate significantly, but there were some significance on parts of observed variable which associated with construct variable.

Conclusion: "Length working life at current facility" was determinant that influenced the relationship between motivation and job satisfaction.

Keywords: *Human Resource, Health Worker, Job Satisfaction, Motivation, Indonesia.*

Introduction

Primary Health Care/PHC (PUSKESMAS) is a first line of community health service in Indonesia, located in every sub district in Indonesia, and their duties are to promote, prevent, curative and rehabilitate of health communities based on National Health. The best performance and productivity of health worker is important to manifest it. The most common approach to achieve that is optimizing motivation and job satisfaction of health worker.[1] National study showed motivation and job satisfaction of Indonesia's health workers were only 43% and 23%.[2]

World Health Organization (WHO) already recommended the policy to improve motivation and job satisfaction of health worker at health facility.[3–5] The strategies were incentive, learn new skill[6], supportive supervision[7], strategy for future carrier[8], work atmosphere[9], and etc. All of the strategies are depend to the basic characteristics of health worker and their working environment or determinant factor. Understanding determinants of motivation and job satisfaction and their relationships is a basic to choose the best strategy, including at Primary Health care/PHC (PUSKESMAS) in Indonesia.

The objective of this article was identified the

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determinants that influence relationship between motivation and job satisfaction at PHC in Indonesia. Structural Equation Modelling (SEM) is a tool of statistic and one approach that can be used to understand and identified the determinant. Through this approach would help policy maker to develop design policy option on health worker responses.

Material and Method

This is an advance analysis from the first study of National Human Resource of Health Study (RISNAKES) 2017 for health worker at government health facility including PHC [2].This was a cross sectional study, the respondent was a physician, dentist, nurse and midwife at PHC and observed at "time study" by independent enumerator from open until closed time of PHC. They were also answer "motivation and job satisfaction questionnaire" themselves (self-administered questionnaire) too. Entry and cleaning of this data were already doing by laboratory Management Data on National Institutes of Health Research and Development, Ministry of Health Republic Indonesia. The respondents signed inform consent voluntary before start the study and they had opportunity to understand the questioner before start answer. All of the initial names or place during recruitment and publication were confidential.

Measurement of motivation was using indicators from instrument in Kenya by Muntale at all, with 23 questionnaires.[10] Meanwhile, the of job satisfaction was using short questionnaire Minnesota Satisfaction Questionnaire (MSQ) that already using in many field study to measure the satisfaction. The determinants factor were "Job suitability" (suitable of health services activity at PHC[11],<80% vs ≥80%), "Regional"(Jawa vs Non-Jawa-Bali, "Occupational"(Physician vs Not Physician), "Adequate income" (adequacy of one month salary for their live activity; Yes vs No), "Saving money" (capability of health worker to saving his income from 1 month salary; Yes vs No), "Length of working life at health facility(<8 years vs ≥ 8 years), and "Length of working life at current PHC"(<5 years vs ≥ 5 years).

Univariate analysis used to identify characteristic of respondent, and analysis of reliability indicator of motivation and job satisfaction questionnaire used Cronbach Alpha test with cut off > 0.7.[12] Structural Equation Modelling (SEM) assessed association between motivation and job satisfaction with model fit were CMIN/df<2, RMSEA <0.08, GFI >0.90, CFI>0.90, TLI>0.90 and SRMR nearest <0.08.[13]The reliability and validity of construct variableof model was analysed by Average Varian Extracted (AVE) and Construct Reliability (CR). Invariant measurement was done to identify determinants influence association between motivation and job satisfaction, only p value ≥0.05 can be compared. SEM analysis used AMOS 24.

Results

Total 402 respondents analysed at 302 PHC from 1430 respondents at 425 PHC in "time study", the entire characteristic was showed at table 1.

Table 1: Characteristic respondent of the study (n=402)

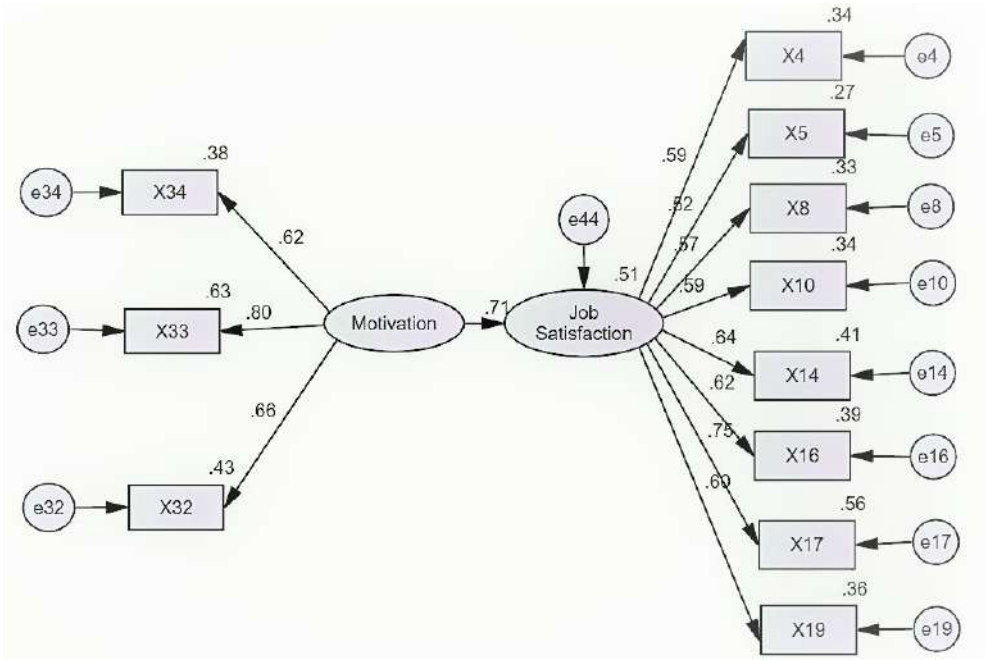
Characteristic	Group	Frequency	Percentage
Sex	Man	79	19.7
	Woman	323	80.3
Occupational	Physician	166	41.3
	Dentist	46	11.4
	Midwife	97	24.1
	Nurse	93	23.1
Job suitability	≥80%	137	34.1
	<80%	265	65.9
Regional	Jawa Bali	140	34.8
	Non Jawa Bali	262	65.2
Adequacy Income	Yes	191	47.5
	No	211	52.5

Characteristic	Group	Frequency	Percentage
Saving Money	Yes	170	42.3
	No	232	57.7
Length of working life at health facility	≤8 years	208	51.7
	>8 years	194	48.3
Length of working life at current PHC	≤5 years	224	55.7
	>6 years	178	44.3
	Median (SD)	**Minimum**	**Maximum**
Age (Years)	34(8.18)	22	60
Length of working life at health facility (Years)	8 (7.99)	0.5	37
Length of working at life current PHC (Years)	5 (6.09)	0.5	31

Source: Own research

Mean of 23 indicator of motivation was range (SD) 1.85(0.89) - 4.19(0.56) and 20 indicator of job satisfaction was 2.86(1.04) – 3.89(0.62). The indicators reliable to analyse as a motivation and job satisfaction construct variable with Cronbach Alpha 0.75 and 0.90.

The model based on 23 indicators motivation and 20 indicators job satisfaction were developed and showed only 3 indicator of constructs motivation and 8 of job satisfaction were selected. The model was fit with CMIN/df=1.696, GFI=0.971, TLI=0.969, CFI=0.976, RAMSEA=0.042, SRMR=0.036, all the path diagram was differently significant (p<0.000) (figure 1). The AVE for construct motivation was 0.48 and job satisfaction was 0.36, meanwhile CR of construct motivation was 0.73 and job satisfaction was 0.83. This result can be accepted and indicating the variable were reliable and valid[14].



Note: X4="The chance to be "somebody" in the community", X5="The way my boss handles his/her workers", X8="The way my job provides for steady employment", X10="The chance to tell people what to do", X14="The chances for advancement on this job", X16="The chance to try my own method of doing the job", X17="The working conditions", X19="The praise I get for doing a good job", X32="I am proud to be working for this hospital",X33= "I find that my values and this hospital's values are very similar", X34="I am glad that I work for this facility rather than other facilities in the country". Source. Own research

Figure 1: Model fit of relationship between motivation and job satisfaction (standardized regression weight).

The result of invariant measurement for determinants showed only factor "Job suitability" (P value of measuring weights=0.122, P value of structural weight 0.167), "Regional" (0.231, 0.283), "Length of working life at health facility "(0.189, 0.091), "Length of working life at current PHC (0.288, 0.070)" can be compared and the model was fit. The comparative analysis showed only "Length of working life at current PHC" influences association between motivation and job satisfaction (regression weight estimate <5 years vs ≥5 years; 0.81 vs 0.47, p<0,05) with significantly different indicator "glad work at current PHC"< 5 years higher than ≥5 years. There were still significances different on some parts of observed variable at "Regional" construct; i.e. job stability (X8) and job advancement (X14); and "Job suitability"construct; i.e. praise/appreciation for good job(X19);although no significant influenced to relationship between motivation and job satisfaction. Meanwhile, there were dominantly different indicator for determinants "Occupational", "Adequate income" and "Saving money", i.e indicator the way of X5, job stability (X8), job advancement (X14), chance used own method (X17), praise/appreciation for good job(X19), and glad work at current PHC (X34), though they were no invariant.

Discussion

There was a significantly association between motivation and job satisfaction of physician, dentist, nurse, and midwife (health worker) at PHC in Indonesia. The 11 indicators depicted the working environment (extrinsic motivation) of organization and showed the harmonization between environment and health worker and this confirmed the "work motivation" theory and "work adjustment theory".[15,16] In this study, the motivation has related with 51% variance of job satisfaction, this condition showed motivation of health worker play an important role for job satisfaction of health worker at PHC in Indonesia. Someone with higher motivation had a power from inside and makes the person do important better for themselves and make them satisfy. [6,17–19]

The association between motivation and job satisfaction was significantly different in "Length of working life at current PHC" group, which working life ≤ 5 years had higher association than > 5 years. It showed that manage "length time of working "was important to improve relationship between motivation and job satisfaction. The important indicators to manage that were the working condition and happiness. This situation consistent with other studies and showed "working condition" such as quality team collaboration, positive work environment, moral distress, interaction with management and health worker, length of working, would influence the motivation and job satisfaction.[20-22] Moreover, the management of human resource, leadership, job description, infrastructure, environment, "being important" might relate with the situation of health facility/PHC that influence the happiness of health worker.[23] However, the relationship was same after 8 years working at PHC.

Praise/appreciation,jobstabilityandjobadvancement were important indicators that differently significance in determinant "Job suitability" and "Regional" even both of them were not influencing the relationship between motivation and job satisfaction. Praise/appreciationis important in order get high job suitability and study on Chinese Nurses showed that psychological reward as a praise/appreciation would increase job satisfaction beside a psychological payment.[24] Meanwhile, many health workers had hesitation about their job stability and advancement if their work at remote area or with the low economic is. This is consistent with study at Pakistan, that building carrier progression was needed for motivation and retention of health worker.[25]

Determinants "Adequate income", "saving money" and "Occupational" were not influence the relationship between motivation and job satisfaction, buttheir dominant indicator showed working condition was crucial for health worker. How organizational factor such as reward from leader, manage the job description, incentive and etc. are important. This is consistent that the health worker need good environment to make sure they get what their need and achieve the target.[6,25,26]

There were limitations of this article, first, the total sample size only a part of total sample of National Human Resource of Health Study (RISNAKES) 2017, but this was enough to show the association with Structural Equation Modelling (S'EM). Second, RISNAKES conducted only one day activity observed of health worker, but based on their job description, one daily activity in one PHC similar with others, so the measurement enough to show the activity. Third, when measure the motivation and job satisfaction, the study used self-determined questionnaire, so the potential bias could happen, to reduce the possibility, the enumerators trained to explain answer the question.

Conclusion

"Length of working life at current facility" influences the relationship motivation and job satisfaction of physician, dentist, nurse, midwife and pharmacist at PHC in Indonesia. Working condition/environment is important to optimize the relationship between motivation and job satisfaction.

Policy Option: The policy option based the result of this study are:

1. Develop and optimize working condition to manage length of working before and after 5 years working at PHC. The health worker should be given opportunity to move or stay to other facility with their intention periodically (after 5 years) based result of evaluation and monitoring.
2. Make motivation and satisfaction survey for health worker periodically to ensure their intention working at PHC

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Conflict of Interest: Authors declare that there is no conflict of interest.

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Ethical Clearance: Ethical commission National Institutes of Health Research and Development approved the ethic of this study.

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Risk Factors for Obesity in Patients with Hypertension

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Abstract

Background: Non-communicable diseases (NCDs) are a leading cause of death worldwide. In 2018, NCDs' prevalence had reportedly increased since 2013. Hypertension was the biggest cause of NCDs diagnosed in health facilities, from 25.8% to 34.1%. Patients with hypertension and obesity are at increased risk of complications from diabetes mellitus and kidney disease.

Objective: The present study aimed to determine risk factors for obesity in patients aged 25–69 years with hypertension.

Materials and Method: This was an observational study with a cross-sectional design, using secondary data from the 'Cohort Study of Risk Factors of Non-communicable Diseases', conducted in Bogor City, Kebon Kelapa Village in 2017. The population in this study included adult patients with hypertension aged 25–69 years.

Results: The prevalence of obesity in patients with hypertension was 47.4%.Risk factors that were significantly related to obesity in patients with hypertension included age groups 25–44 and 45–59, female gender and excessive energy intake (p = 0.009, 0.050, 0.025 and 0.039, respectively and odds ratio = 2.43, 1.73, 1.85 and 1.85, respectively).

Conclusions: Risk factors associated with obesity in patients aged 25–69 years with hypertension included age, gender and energy intake.

Keywords: *Obesity, hypertension, adult, elderly.*

Introduction

Non-communicable diseases (NCDs) are the leading cause of death worldwide. Around 15 million people aged 30–69 years die each year from NCDs, with 85% occurring in low and middle-income countries.[1] NCDs' prevalence increased in Indonesia between 2013 and 2018.[2]

Hypertension is a leading cause of cardiovascular disease that can lead to strokes, coronary heart disease, kidney failure and premature death.[3–6] It is estimated to cause 12.8% of deaths worlwide.[7] In 2018, hypertension was the main cause of NCDs diagnosed in health facilities. Hypertension's prevalence increased from 25.8% in 2013 to 34.1% in 2018.[2]

Studies have reported that the prevalence of obesity among patients with hypertension is increasing. A study by Ford et al. using data from the National Health and Nutrition Examination Survey showed that obesity's prevalence increased from 25.7% from 1976–1980 to 50.8% from 1999–2004 in adults with hypertension.[8] Qin et al. also reported an increase in the prevalence of obesity and central obesity in hypertensive adults in China.[9] A study by Sartika et al. showed that obesity's prevalence in Indonesian patients with hypertension was 40.7% in urban areas and 18.9% in rural areas.[10]

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Patients with hypertension and obesity are at increased risk of complications of type 2 diabetes mellitus and kidney disease.[11, 12] Obesity status in patients with hypertension is associated with a significant difference in the average onset age of type 2 diabetes mellitus.[12] In patients with hypertension, obesity and insulin resistance also play major roles in the genesis of kidney failure, which is known as 'nephrosclerotic hypertension'.[11]

Risk factors such as age, gender, education, income, diet, physical activity, hypertension treatment, smoking and stress contribute to the incidence of obesity in patients with hypertension. Risk factors for obesity complications in patients with hypertension vary greatly among regions.

The present study aimed to determine the risk factors for obesity complications in patients with hypertension aged 25–69 years in Bogor City in 2017. This study's results are expected to provide an evidence base for appropriate health programmes to prevent obesity in patients with hypertension.

Materials and Method

The present study was cross-sectional in design and analysed secondary data from the 'Cohort Study of Non-communicable Diseases', conducted by the National Institute of Health Research and Development, Republic of Indonesia, in Bogor City, Kebon Kelapa Village, in 2017. This study's population were all patients with hypertension aged 25–69 years who were respondents in 2017. Hypertension was defined as systolic blood pressure >140 mmHg and/or diastolic blood pressure >90 mmHg, doubling of blood pressure within 5 min under appropriate conditions, diagnosis of hypertension by a health professional or undergoing treatment for hypertension. A population of 489 patients with hypertension aged 25–69 years was selected from the 'Cohort Study of Non-communicable Diseases', conducted in 2017. This research sample was selected using total population sampling. Respondents with heart disease (n = 50), stroke (n = 44), diabetes mellitus (n = 118) and pregnancy (n = 1) were excluded from the study sample. Thus, 318 respondents were included in the study.

The dependent variable in this study was obesity status, with a body mass index (BMI) parameter >27 kg/m². BMI was calculated as body weight in kilograms divided by the height in metres squared and categorised as: underweight (<18.5 kg/m^2), normal weight (18.5–25.0 kg/m^2), overweight (25.1–27.0 kg/m^2) and obese (> 27 kg/m^2).[13] Independent variables were age, gender, education, conversation, nutrition intake, physical activity, hypertension treatment, smoking and stress. Nutrient intake was measured as the amount of energy, carbohydrate, protein, fat and sodium consumed daily compared with dietary recommendations for people with hypertension (DASH).[14] Intake of nutrients was categorised as low (<90%), moderate (90% –119%) and high (≥120%).[15]

Data processing involved cleaning and transforming data and was performed by univariate and bivariate using chi Square test with a 95% confidence interval (CI) (α = 0.05) and odds ratios (ORs).

Results

Characteristics of patients with hypertension: Analysis of nutritional status in patients hypertensive aged 25–69 years showed malnutrition in 1.6%, normal nutrition in 35.3%, with 15.7% overweight and 47.4% obese. The prevalence of hypertension was greatest (53%) among those aged 45–59 years (pre-elderly). The incidence of hypertension was highest (72.6%) among females compared with males. Most (65.1%) patients with hypertension were of low education status. The patients' characteristics are presented in Table 1.

Table 1. Characteristics of patients with hypertension aged 25–69 years

Variables	Category	N	%
Nutritional Status	Underweight	5	1.6
(n = 312)	Normal	110	35.3
	Overweight	49	15.7
	Obese	148	47.4
	Missing	6	

Variables	Category	N	%
Obesity	No	164	52.6
(n = 312)	Yes	148	47.4
	Missing	6	
Age (Years)	25–44 (adult)	67	21.1
(n = 318)	45–59 (pre-elderly)	168	53.0
	60–69 (elderly)	82	25.9
Gender	Male	87	27.4
(n = 318)	Female	231	72.6
Education status	High	111	34.9
(n = 318)	Low	207	65.1
Income	Low	159	50.0
(n = 318)	High	159	50.0

Source: Secondary data processed

Prevalence and risk factors for obesity in patients with hypertension: The prevalence of obesity in patients with hypertension was quite high (47.4%) and was higher in females compared with males (51.5% vs. 36.5%). Obesity in patients with hypertension mostly occurs in adulthood, from age 25 to 44 years. The prevalence of obesity was higher in patients with a low education status compared with those who were highly educated (50.2% vs. 42.3%). Nutrient intake in obese hypertensive patients showed high energy (58.2%), high carbohydrate (54.8%), adequate protein (61.4%), moderate fat (52.4%) and low sodium (50.3%) intake.

The bivariate analysis showed that factors were significantly related ($p < 0.05$) and the risk factors for obesity in patients with hypertension were age, gender and energy intake. Adult patients with hypertension aged 25–44 years showed a 2.43-fold higher risk of obesity compared with that of elderly patients (aged 60–69 years), and pre-elderly patients (aged 45–59 years) showed a 1.73-fold higher risk of obesity compared with that of elderly patients (aged 60–69 years). There were 1.85 times more female than male patients with hypertension. High energy intake in patients with hypertension was 1.85 times higher than low energy intake. The results of the bivariate analysis of risk factors for obesity in patients with hypertension are presented in Table 2.

Table 2. Risk factors for obesity in patients with hypertension aged 25–69 years

Variables	Obesity				Total		OR	P-value
	No		Yes					
	N	%	N	%	N	%		
Age (years)								
25–44 (adult)	28	42.4	38	57.6	66	100.0	2.433	0.009*
45–59 (pre-elderly)	84	50.9	81	49.1	165	100.0	1.729	0.050*
60–69 (elderly)	52	64.2	29	35.8	81	100.0		
Gender								
Male	54	63.5	31	36.5	85	100.0		
Female	110	48.5	117	51.5	227	100.0	1.853	0.025*
Education								
High	64	57.7	47	42.3	111	100.0		
Low	100	49.8	101	50.2	201	100.0	0.792	1.375
Income								
Low	83	53.9	71	46.1	154	100.0		
High	81	51.3	77	48.7	158	100.0	1.111	0.725

Variables	Obesity				Total		OR	P-value
	No		Yes					
	N	%	N	%	N	%		
Energy intake								
Low	85	57.0	64	43.0	149	100.0		
Moderate	40	50.0	40	50.0	80	100.0	1.328	0.308
High	28	41.8	39	58.2	67	100.0	1.850	0.039*
Carbohydrate intake								
Low	91	54.2	77	45.8	168	100.0		
Moderate	34	51.5	32	48.5	66	100.0	1.112	0.714
High	28	45.2	34	54.8	62	100.0	1.435	0.226
Protein intake								
Low	129	54.2	109	45.8	238	100.0		
Moderate	17	38.6	27	61.4	44	100.0	1.880	0.060
High	7	50.0	7	50.0	14	100.0	1.183	0.759
Fat intake								
Low	51	55.4	41	44.6	92	100.0		
Moderate	30	47.6	33	52.4	63	100.0	1.368	0.339
High	72	51.1	69	48.9	141	100.0	1.192	0.514
Natrium intake								
Low	71	49.7	72	50.3	143	100.0		
Moderate	33	55.0	27	45.0	60	100.0	0.807	0.487
High	49	52.7	44	47.3	93	100.0	0.885	0.648
Hypertensive medication								
No	60	37.3	101	62.7	161	100.0		
Yes	48	34.0	93	66.0	141	100.0	1.151	0.643
Type of hypertensive medication								
Captopril	6	33.3	12	66.7	18	100.0		
Amlodipine	35	32.1	74	67.9	109	100.0	1.057	
Nifedipine	6	46.2	7	53.8	13	100.0	0.583	
Bisoprolol	1	100.0	0	0.0	1	100.0	0.000	0.396
Low physical activity								
Yes	50	32.7	103	67.3	153	100.0		
No	59	40.4	87	59.6	146	100.0	0.718	0.205
Moderate physical activity								
Yes	105	36.1	186	63.9	291	100.0		
No	4	57.1	3	42.9	7	100.0	0.423	0.456
High physical activity								
Yes	9	47.4	10	52.6	19	100.0		
No	100	35.8	179	64.2	279	100.0	1.611	0.445
Smoking								
No	121	51.7	113	48.3	234	100.0		
Yes	43	55.1	35	44.9	78	100.0	0.872	0.695
Stress								
No	144	52.0	133	48.0	277	100.0		
Yes	11	52.4	10	47.6	21	100.0	0.984	1.000

* $p < 0.05$

Source: secondary data processed

Discussion

Our results indicate that the prevalence of obesity in patients with hypertension aged 25–69 years in Bogor City in 2017 was high (47.4%). This high prevalence is in line with findings from previous studies by Ford et al. (2008), Qin et al. (2013) and Sartika (2015).[8,9.10] The cause of obesity among patients with hypertension is multifactorial. The level of hypertension, socioeconomic status, residential area, consumption of red meat, physical activity, hypertension treatment, family history of diabetes, hypertension and heart disease, which is associated with obesity among people with hypertension.[9]

In the present study, risk factors for obesity complications in patients with hypertension were found to be age, gender and energy intake. Residential area, consumption of red meat, family history of diabetes, family history of hypertension and family history of heart disease could not be analysed due to limited secondary data.

The prevalence of obesity in patients with hypertension was higher in adults aged 25–44 years than in pre-elderly (45–59 years) and elderly (60–69 years) patients. Under normal conditions, age is associated with obesity as metabolism decreases with age, which increases the risk of obesity. However, in the present study with a population of patients with hypertension, adults (25–44 years) showed a higher risk of complications of obesity that was 2.43-fold higher than elderly (60–69 years) patients, whereas this value was 1.73-fold higher in pre-elderly (45–59 years) compared with elderly patients.

The prevalence of obesity in female patients with hypertension was higher than that of males. These findings reveal a significant relationship between gender and incidence of obesity in patients with hypertension. Females with hypertension showed a 1.85-fold higher risk of obesity compared with males with hypertension. This study's results are in line with those reported by Qin et al. (2013).[9] They conducted a study in Lianyuangang, China from October 2008 to September 2009 and showed that the prevalence of obesity in females with hypertension was higher than that of males.[9] Females are at greater risk of obesity since they generally have more fat than males, including a higher amount of subcutaneous fat and more fat deposits in the glutaeal–femoral area or peripherals that determine the typical pear-shaped female (peripheral or gynoid type obesity).[16]

Excessive energy intake is related to obesity in patients with hypertension and is associated with a 1.85-fold increased risk of obesity compared with those with low energy intake. When energy intake exceeds energy expenditure, a positive energy balance occurs, leading to an increase in body mass. A 60% –80% increase in body mass is associated with an increase in body fat.[17] An imbalance between excess energy intake and output results in weight gain, both under normal conditions and in patients with hypertension.

Conclusion

The prevalence of obesity in patients with hypertension aged 25–69 years in Bogor City in 2017 was 47.4%. Risk factors that were significantly related to obesity in patients with hypertension included age (adults aged 25–44 and pre-elderly aged 45–59 years), female gender and excessive energy intake ($p = 0.009$, 0.050, 0.025 and 0.039, respectively and OR = 2.43, 1.73, 1.85 and 1.85, respectively). The high prevalence of obesity in patients with hypertension is a health problem requiring appropriate treatment since controlling weight gain is fundamental to improving quality of life in patients with hypertension. Our results are expected to be used to plan appropriate health programmes and prevent obesity in patients with hypertension.

Conflict of interest statement: The authors declare that there is no conflict of interest.

Ethical Clearance: The present study obtained approval from 'The Research and community engagement Ethical Committee Faculty of Public Health Universitas Indonesia', Ket-593/UN2.F10/PPM.00.02/2019.

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The Role of Social Support on Coping Stress in Type-2 Diabetes Mellitus Patients with Gangrene Complications

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Abstract

This study aims to identify how the type of coping stress strategy for the type-2 diabetes mellitus patients, who experienced gangrene complication. Coping stress strategy is an efforts strategy to overcome feelings of stress due to illness. Coping stress strategy in this study is divided into two types, namely problem-solving effort, and emotion-focused coping. The method used in this study was a qualitative approach by taking three people with type-2 diabetes mellitus and complications of gangrene as participants. The method used for selecting the participants was a purposive approach. The data were collected using structured interviews and field notes. The data was analyzed by using thematic analysis with a theory-driven approach. The result shows that the three participants had a coping stress strategy to heal their stress while experiencing diabetes and gangrene complication. Patients were able to cope well with stress control routine, change their eating patterns, look for information on diabetes mellitus, and exercise regularly. Patients also got supports from professionals, family, and friends. Coping stress strategy techniques for each different subject depend on their surroundings. This study found that there is three dominant coping stress strategy chosen by the patients which are the planful problem solving and the seeking social support that belongs to the problem-solving effort section, and the positive appraisal section that belongs to the emotion-focused coping section. However, three patients also performed stress diversion, called escape/avoidance, to cope with their stress.

Keywords: *coping stress strategies, type-2 diabetes mellitus patients, gangrene complication.*

Introduction

Diabetes mellitus is one of the chronic diseases that have an increased number of patients and become a major public health problem worldwide[1]. According to the World Health Organization, in 2010 the number of people with diabetes mellitus in the world has reached 271 million[2]. In 2010, Indonesia was at the 4th rank globally with 8 million diabetes patients[3]. Diabetes mellitus is differentiated into type 1 and type 2[4].

Type-2 diabetes mellitus causes helpless feeling to its patient, a feeling that appears because he/she cannot change his/her future anymore. This feeling arises based on many causes, such as uncertain health condition, added with recovery and recurrence and also physical regression[5]. Psychologically, when the patient knew that they had diabetes mellitus, there would be concern inside his/her mind about what they will face later. This will lead them to stress stage. The emotions of denying, obsessed, anger, and frustration become the main reasons that eventually can cause stressfulness. This condition will give a negative impact on his/her body[4].

Rustini describes that diabetes mellitus type 2 patient that experience gangrene complication has go through changes in his/her life behaviour, start from dietary habit, physical exercise, blood sugar control, gangrenous wounds treatment, etc that will happen throughout life with patience and in order to make his/her condition stable. Furthermore, patient will suffer physical regression. Gangrenous wounds condition will get worse and rot[6].

Anggraeni and Cahyanti stated that one way to cope with psychological stress that diabetes mellitus patient had is by using a management strategy done by the patient. With this stress management strategy, people with diabetes mellitus, especially those who experience gangrenous complications, will be able to develop their own experiences about their disease including emotional and cognitive aspects which will ultimately help them to decide which stress management strategy is suitable for him/her to handle the stress[7].

Stress management strategy is a process to resolve many demands both internally and externally, which exceed capacity from the patient. The stress management strategy refers to various efforts, both mental and behavioral, to master, tolerate, reduce, or minimize a stressful situation or event[8]. A study conducted by Vázquez *et al.* about stress management strategy showed that optimistic individuals performed problem-solving effort directly in dealing with stressful events and problems associated with their health which in the end will affect their self-care and healing process in the future[9]. Rohmah *et al.* on her research on coping mechanisms said that a good combination of both stress management strategies, namely problem-solving effort, and emotion-focused coping, would provide good results in improving the life quality of people with diabetes mellitus. Understanding of how to regulate diet, treatment, and self-acceptance, as well as the social support from family and surrounding is a strategy of the diabetics which makes their life better[10].

Until today, research about psychological stress condition of a diabetic patient who suffers gangrene complication is still rarely found. Whereas, the data compiled by Rustini shows that the percentage of diabetic patients with gangrene complication has reached 50% of the total number of people with diabetes[6]. Therefore, it is important to make a research to find what type from the stress management strategy that the type-2 diabetes mellitus patients with gangrene complication use.

Materials and Method

This study is a qualitative research with an intrinsic case study. Through a case study approach, the researcher could get a bold and integrated understanding of a special case. The special case was related to the individual. The type of case study used for stress management strategy research on type 2 diabetes mellitus patient with gangrene complication was intrinsic case stud. This type was used to fully understand the case without making new concepts or theories or any generalizations[11].

The participants were appointed purposively, which means the selection of participants was based on meeting certain criteria. The participants were typed 2 diabetes mellitus patients who have gangrene complication. Participants were gone through a screening test using an instrument by Sarafino. This instrument would help to find which participants have the lowest stress level, that later would be interviewed on how they use their stress management strategies that make them survive until now. The participant criteria in this study were type-2 diabetes mellitus patients who experience gangrenous complications, 40-60 years old, have diabetes mellitus and gangrenous complications for more than 5 years, and passed the screening test. The data was collected using interview and field notes. The interview was guided by general guidelines. These general guidelines were used to remind the interviewer about the questions, and as a checklist for whether the aspects discussed and asked was relevant or not. This research used thematic analysis. Thematic analysis is an information coding process which produces topic lists, topic models and related qualification[12].

Results

In this research, there were various reactions from diabetes mellitus patient with gangrene complication, for example; shocked, disappointed, and depressed because his/her incomplete feet, pulling themselves from society and becoming helpless. We also found that this disease not only caused patients to lose physically but also psychologically. A patient who has stress experience because of this disease can also be found in this research. Initially, after suffering from gangrene complications and having to be amputated, diabetics could not accept the condition and often felt anxious about their current physical limitations. On their attempts to accept the reality they used stress management strategy in the form of confrontative coping. They did a lot of confrontative coping efforts such as not wanting to be taken to the hospital, lying to cover up their actual foot and physical condition to the doctor, and also not wanting to be amputated. Because of that, one of the patients had to go through longer treatment because he/she refused to get amputated.

Diabetics also need support from people around them. Social support is one of the indicators of the

stress management strategy from the problem-solving dimension, called seeking social support. Social support from the surroundings is very much needed to motivate the patients in order to recover. Without it, they might not survive until now. The types of social support that are received and needed by each person with diabetes are actually the same, but they also depend on the individual character and the environment. Patients with diabetes mellitus who have a supportive family would tend to ask help from their children and their partners, while patients who are closer to their friends would tend to ask support from friends. Patients admitted that social support from people around them has enhanced their spirits during their treatment. Diabetics with gangrene complication also have long-term plans to maintain their condition, focusing on how to heal the wound, to prevent stress, and to stay healthy. This step is included in a stress management strategy, specifically belongs to the problem-solving effort dimension, and called planful problem-solving. The action of planful problem solving performed by the patient, in this case, was shown by doing treatment and taking medication regularly. The other actions were shown by running diabetic diets to maintain blood sugar levels, fasting, consulting to a doctor, and treating the wounds regularly. These patients also learned about their disease in order to understand what to do with it.

In this study, diabetics with gangrenous complications also had a stress management strategy in the form of self-control to deal with stress due to their illness. It was found that self-control performed by the patients by not telling their problem if they could solve it themselves. They tried to sort out what things need to be told and what to be handled by their own. The next stress management strategy that these patients used was distancing. It was found that the distancing was performed by not to overly think about their illness and not to mourn about it. Patients tried to prevent stress by assuming that everything has its time.

In this study, it was found that diabetics with gangrene also carried out stress management strategies in the form of positive appraisal. The positive appraisal done by the patients was by being grateful to be able to survive until now and trying to find a positive meaning behind their situation. Patients also had an inspiration that makes them optimistic to be recovered. They had goals and had known what was important in their lives, for example, patients were eager to be healthy because they wanted to see their children succeeded and grew up. Patients also tried to get closer to God by increasing worship and pray. They felt relieved after poured out all his heart during their prayers. It helped him/her to be calmer and less stressful in living his/her life. These positive appraisals helped the patients to relax and get optimal treatment. These patients have also done stress coping strategies in the form of accepting responsibility. In this study, the action of accepting responsibility was shown by acknowledging their diet mistakes which have led them to experience diabetes mellitus and gangrenous complications.

Discussion

Even though they have good planning to maintain their condition, diabetics with gangrene complication have also been in a condition where he/she is truly saturated with all the medical routines he/she has been doing. This is a stress diversion called escape/avoidance. In this study, it was found that the patients tried to divert stress by imagining a condition where he/she was not a person with diabetes mellitus. As explained above the patient was an active person, with the current situation sometimes they really wanted to feel normal like before. The patient also forgot to eat the diet that was suggested, even though he/she knew that the food was not good for his/her health. The stress management strategy in this study used the basic strategy described by Taylor. Stress management strategies are divided into 2 types, namely problem-solving effort, and emotion-focused coping that will be done by everyone when experiencing a stressful experience. In this study, diabetics with gangrene condition used both stress management strategies to manage their stress. Problem-solving effort is an attempt to do something constructive to overcome a situation that creates social stress, including an adverse, dangerous or challenging event faced by an individual. Meanwhile, emotion-focused coping is an attempt to regulate the emotions felt by individuals while facing social stressful event. In this study, we found that there were three biggest stress management strategies performed by the three patients. In the problem-solving effort section, there were the planful problem-solving actions and the seeking social support actions. While in the emotion-focused coping section, there were positive appraisal actions. These means that the three patients focused on their plans to solve the problem, their steps to overcome the wound condition so that they could prevent stress condition. After that, the three patients surrendered entirely to God. All of them agreed to surrender themselves and looked for the positive

meaning behind their current situation. They were aware of their priorities at the moment and not focusing on their sadness. The third is a stress management strategy that will not succeed without the support of people around the patient[8]. This support makes the patient strong and eager to go through the day as well as motivates them to be healthy and healed. This support comes from family, neighbors, friends, and people closest to the patients, including medical personnel.

Conclusion

Diabetes mellitus is not only caused by genetic factors. All the three patients in this study, despite having the genetic factors, they also did not maintain their diet well. It was this diet that eventually led them to have diabetes mellitus and gangrene complications. The three patients showed different performance on handling stress using stress management strategies. There were three biggest stress management strategies performed in this study: the planful problem solving and the seeking social support which belongs to the problem-solving effort section, and the positive appraisal section which belongs to the emotion-focused coping section. The strategies focused on how they plan to solve the problem, what steps they must take to overcome the wound condition, and then surrender entirely to God. All three patients looked for the positive meaning behind their current situation and were aware of their priorities at that moment. Then, those strategies would not succeed without the support of people around the patient. This support made the patient strong and motivate them to heal. The support came from family, neighbors, friends, and people closest to the patients, including medical personnel. There was a difference regarding which was the most dominant stress management strategy used by each patient. The difference is caused by how the environmental conditions where the patient live.

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The Relationship of Work Instructions Compliance with Safe Behavior of Production Part Workers in PT X

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Abstract

Metal casting industry which is having high risk to work accidents and have applied work instructions (IK) to all unit working parts. Based on preliminary survey in PT X the level of work instructions compliance is 70% and 80% of workers safe behavior. The majority of workers work instructions compliance and safe behavior, but there are still workers did not compliance with work instructions and safe behavior. This study aimed to analyze the relation of work instructions compliance with safe behavior of production part workers in PT X. The kind of research is quantitative observational with cross sectional analytic approach that studies the relationship independent variabel with dependent variabel. The research population is all labor production section in PT X many as 74 people with the sample many as 48 people has been present working on the research day. The results of the fisher's exact test showed (p=0,03) < 0,05 which means Ho rejected so that there was a correlation between work instructions compliance with safe behavior at production line workers in PT X. Conclusions of the study, that there is a significant relation exsist between work instructions compliance with safe behavior. Advice for the company are to be able to establish P2K3, hold an inspection formal and informal.

Keywords: *Work instructions compliance, safe behavior.*

Introduction

The development of industrialization and modernization is increasingly rapid resulting in increased operational work intensity, so that there are various impacts such as fatigue, loss of balance, lack of skills, lack of knowledge about sources of danger are the causes of accidents and work-related diseases that can affect company performance[8]. Manpower, Transmigration, and Population offices of the Central Java Provincial Government noted an increase in work accident data in 2015 which amounted to 3,083 work accidents compared to 2014 which amounted to 2,549 work accidents[3].

Accident events based on data, facts and experience are a series of events because of the potential for interrelated hazards, workplace accidents can be caused by work or unsafe actions such as those related to protective machinery, can be moved or modified sequences, work indoors withbad lighting and so on.In various studies of workplace accidents dangerous behavior is an important indicator[7,10].

There is a significant relationship between compliance with work instructions and safe behavior obtained p value of 0.01 <0.05 which indicates the relationship of compliance with work instructions and safe behavior is being at the mechanical part employees of PT Y[1].

PT X has applied Work Instruction (IK) to all work units. All work process activities and actions are carried out daily based on abbreviated work instructions (IK) which are supervised by each section head. Based on the

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results of the preliminary survey in the production section of PT X the level of compliance with work instructions was 70% and as much as 80% of workers behaved safely. Most workers obey work instructions and work safely, but there are still workers who do not comply with work instructions and behave unsafe. Based on this background, researchers are interested in knowing the relationship of work instructions compliance with safe behavior of production part workers in PT X.

Material and Method

This type of research is an observational quantitative study using an analytical cross sectional approach that studies the relationship of independent variables, namely work instructions compliance with dependent variables, namely safe behavior that is assessed and measured simultaneously in one time[5].

The population of this study is that all the production workforce in PT X numbered 74 people with a minimum sample size of 43 people and at the time of the study a total of 48 workers were present and were willing to be studied. The independent variable is work instructions compliance using the obedient category ≥ mean and <mean for the non-compliant category and the dependent variable for safe behavior using the safe category ≥ mean and<mean for the unsafe category. Using univariate and bivariate analysis with the provisions of the chi-square test, namely the null hypothesis (Ho). If p value <0.05, then Ho is rejected and if p value is ≥ 0.05 then Ho is accepted.

Findings:

1. **Age of Respondents:**

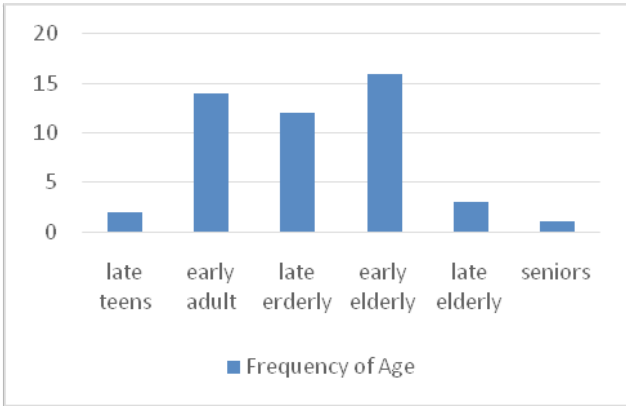

Figure 1. Age of Respondents

Most of the production workers at PT X were in the early age, 33.3% and only 2.1% were elderly workers. age is directly proportional to one's physical capacity and reaches its peak at the age of 25 years, increasing age will be followed by a decrease in physical capacity such as sharpness of vision, hearing, speed of distinguishing things, making decisions and the ability to remember. Production workers at PT X are almost all productive and can work well[8].

2. **Work Period of Respondents:** The number of workers with the highest working period of production at PT X for a very long working period is 37.5% and the number of workers with the least working period during the long service period is 10.4%. a long working period can have an influence on the experience of workers so that the longer the working period, the experience they have will be more and more mature and vice versa[2,4]. Most of the workers in the production of PT X have very long working hours so that they have good experience and skills that can support the smooth running of the work and can complete their tasks quickly and precisely.

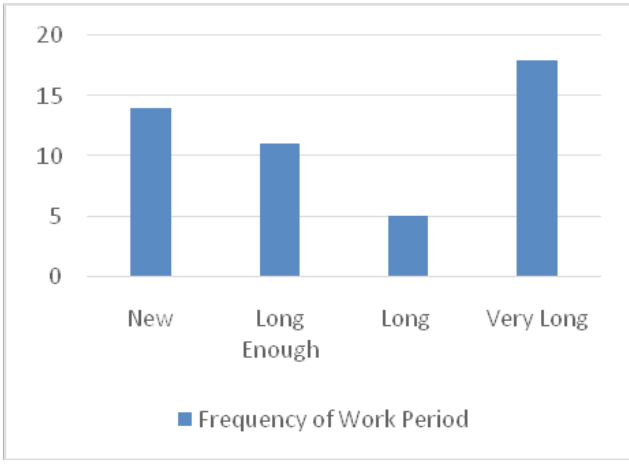

Figure 2. Work Period

3. **Education of Respondents:** From the table known that the majority of workers with high school education or equal to 70.8%, and only 2.1% of workers who did not go to school or did not complete elementary school. education is important in dealing with technological developments, so workers can use and maintain it if damage occurs. Based on research, production department workers at PT X have mastered the work they are doing, skillfully and skillfully using equipment, and processing materials such as printing sand without mold, pouring steel liquid in the production process, where education is needed in this case because of

the accuracy in calculations when pouring hot steel liquid, it must be measured correctly[8].

Table 1. Education of Respondents

Age	Behavior		Total
	Safe	Unsafe	
Late teens	2	0	2
Early adult	10	4	14
Late adult	9	3	12
Early elderly	12	4	16
Late elderly	2	1	3
Seniors	1	0	1
Total	36	12	48

4. **Age with Behavior:** Most of the workers who behave safely are in the early age, which is 25%, with early aged workers who behave unsafe at 8.3%. age is directly proportional to one's physical capacity and reaches a peak at the age of 25 years, increasing age will be followed by a decrease in physical capacity such as sharpness of vision, hearing, speed of distinguishing things, making decisions and the ability to remember[8].

Table 2. Age with Behavior

Education	Frequency	Percent (%)
No school	1	2,1
Graduated from elementary school	9	18,8
Graduated from junior high school	4	8,3
Graduated from high school	34	70,8
Total	48	100

5. **Work Period with Behavior:** Most workers who behave safely enter a very long working period of 27.08%, but there are still those who behave unsafe at 10.42% even though they have entered a very long working period.the longer a person's working period, the more experience he has and the more mature he has, but there are still those who do not behave safely because they already feel experienced and skilled in doing work[4].

Table 3. Work Period with Behavior

Work Period	Behavior		Total
	Safe	Unsafe	
New	10 20,86%	4 8,34%	14 29,2%
Long enough	8 16,65%	3 6,25%	11 22,9%
Long	4 8,32%	1 2,08%	5 10,4%
Very long	13 27,08%	5 10,42%	18 37,5%
Total	35 72,91%	13 27,09%	48 100%

6. **Education with Safe Behavior:** The biggest workers with high school education were 52.06% who behaved safely but still had workers who did not behave safely with a high school education of 18.74%.

Table 4. Education with Safe Behavior

Education	Behavior		Total
	Safe	Unsafe	
No school	1 2,1%	0 0,0%	1 2,1%
Graduated from elementary school	7 14,6%	2 4,2%	9 18,8%
Graduated from junior high school	3 6,2%	1 2,08%	4 8,3%
Graduated from high school	25 52,06%	9 18,7%	34 70,8%
Total	**36 74,98%**	**12 25,02%**	**48 100%**

7. **Working Conditions:** Working conditions in the production section of X can be seen that 100% of respondents observed work in safe working conditions.

Table 5. Working Conditions

Working Condition	Frequency	Percent (%)
Safe	48	100
Unsafe	0	0
Total	48	100

8. **Work Instructions Compliance:** Work instructions compliance for the production workforce of PT X amounting to 71% of respondents obeying work instructions while 29% of respondents did not comply with work instructions given by the company.

   Most workers have complied with the work instructions well even though there are no officers

who supervise, such as checking equipment before use, writing work reports that have been completed, using personal protective equipment arranged in work instructions such as glasses, earplugs, masks, clothes protectors, gloves, shoes. They follow work instructions correctly because they understand that they work with considerable danger, namely the risk of being exposed to melt and hot steel splashes, but there are still workers who are not obedient such as not checking the equipment to be used first, not using personal protective equipment when work because workers reason that when using personal protective equipment they will feel uncomfortable and disrupt their activities, that is, they are not free.

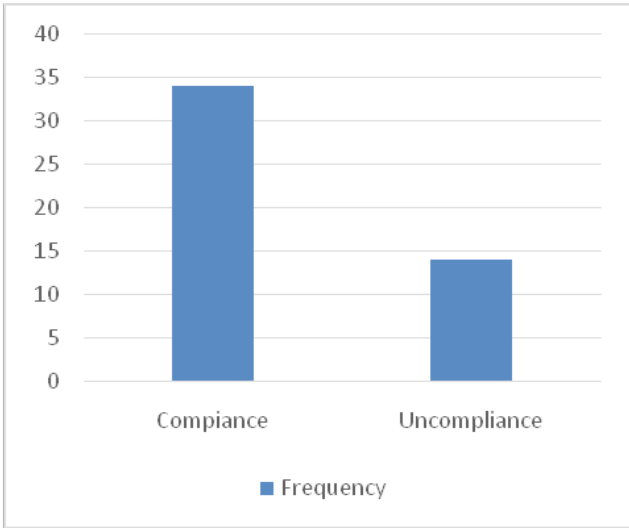

Figure 3. Work Instruction Compliance

9. **Safe Behavior:** The safe behavior of production workers at PT X at 73% of workers behave safely while 27% of workers who do not behave safely when working.

   Workers behave safely such as using personal protective equipment even though they are not supervised, use equipment according to their functions, do not joke while working, but based on research there are still workers who behave unsafe such as smoking in the work area, black sand workers who do not use protective equipment self at all, do not use personal protective equipment that is complete using earplugs, gloves but do not use glasses when welding, unsafe work positions such as working positions for too long squatting and bending when forming sand resulting in back pain, exposed to sparks during the induction process and when pouring steel liquid into the mold.

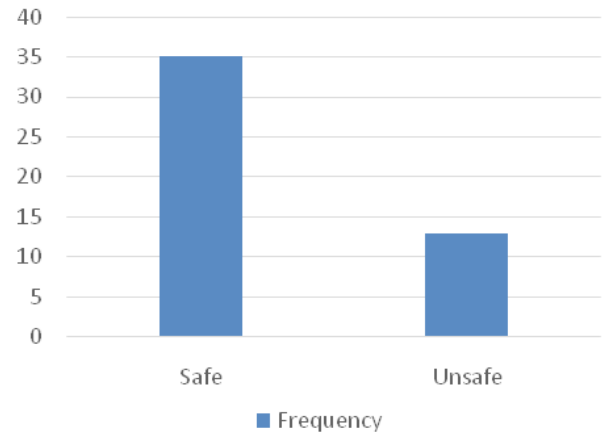

Figure 4. Safe Behavior

10. **Relationship between Work Instructions compliance with Safe Behavior:** The results of the chi-square statistic test showed that the use of the chi-square test was not fulfilled because there was an expeted value <5 so that using the value of fisher's exact test, the results of fisher's exact test showed p value of 0.03 <0.05 which means that Ho was rejected between compliance with safe conduct of work instructions for production workers at PT X. Statistical test results, the correlation between work instructions compliance with safe behavior produces a number of 0.29, the figure shows a low correlation level[6].

    Based on the results of statistical tests, it was found that production workers at PT X were observed, workers who obeyed work instructions and behaved safely were 52.08%, workers who did not comply with work instructions but behaved safely were 20.83%, obedient workers work instructions but not as safe as 18.75%, workers who do not comply with work instructions and do not behave safely are 8.34%.

    This research is in line with previous research that there is a relationship of work instructions compliance with safe behavior on employees of the mechanical part of PT Y with a p value of 0.01 <0.05[1]. and there is a relationship between the practice of applying the SOP with the incidence of workplace accidents and the practice of nurses with a p value of 0.002[9].

    It is known from statistical tests that the more obedient to work instructions, the workers tend to behave safely in the workplace. Workers at PT X who are obedient to work instructions realize that the importance of work instructions to be

understood and adhered to because they know they work in a place that is at high risk for accidents and by behaving safely such as using personal protective equipment that is using glasses, earplugs, masks, protective clothing, shoe gloves so that they can protect them while working.

But there are still workers who do not comply with work instructions because they feel familiar with the work done such as not checking equipment to be used, not using personal protective equipment, then behaving unsafe such as smoking in work areas because there are no sanctions directly given, no using personal protective equipment based on research workers reasoned uncomfortable and felt complicated when they had to use personal protective equipment and they used personal protective equipment completely only when there was a visit.

Table 6. Relationship between Work Instructions compliance with Safe Behavior

Compliance	Behavior		Total	P/r
	Safe	Unsafe		
Compliance	25 52,08%	9 18,75%	34 70,83%	0,03/0,29
Uncompliance	10 20,83%	4 8,34%	14 29,17%	
Total	35 72,91%	13 27,09%	48 100%	

Conclusion

Base on the result of the study it can be concluded that the Most of the production workers at PT X are in the early age, which is 33.3% and those who behave safely for the early elderly are 25%. The working period of most production workers has entered a very long working period of 37.5% and workers who enter very long work periods behave safely at 27.08%. Most of the workers have high school education or equal to 70.8% with workers with high school education who behave safely at 52.06%. 100% safe working conditions, namely the work area free from garbage, there are no water spills on the floor, there are label items, equipment used in good condition, personal protective equipment is available in good condition, there are hygiene facilities, and there is a first aid kit in each part of the work. Workers who adhere to work instructions based on the results of the study are 71%.Workers who behave safely are based on the results of research, which is 73%.

There is a significant relationship between work instructions compliance and safe behavior of production part workers in PT X.

Conflicts of Interest: All authors have no conflict interest to declare.

Source of Funding: The source of the research cost from self.

Ethical Clearance: The study was approved by the institutional Ethical Bord of the Muhammadiyah Surakarta University, Faculty of Health Sciences, Public Health Study Program.

All subjects were fully informed about the procedures and objectives of this study each subject prior to the study signed an informed consent form.

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The Relationship of Age and Work Period with Hearing Disorders on Workers Which are Exposed to Noise Above Threshold Limit Value of Loom Part Weaving Ajl Department in Pt Bintang Asahi Tekstil Industry

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Abstract

The production process at Loom part Weaving AJL Department PT Bintang Asahi Textile Industry using machines with loud noise can cause noise and the risk of causing hearing loss for workers. PT Bintang Asahi Textile Industry been providing a blob ear protective devices threads to protect workers from exposure to noise. But the level of awareness of workers are still lacking in the use of PPE compliance. This study aimed to analyze the relationship between length of service and age with hearing loss of workers exposed to noise> Threshold Limit Value on the Loom Weaving Department AJL PT Bintang Asahi Textile Industry. This research uses a quantitative research design with cross sectional analytic. The population in this study were working Loom part Weaving AJL Department with a sample of 71 respondents taken by simple random sampling. Data analysis used Product Person. The results showed no relationship between age and hearing loss of workers part Loom Weaving Department AJL (p = 0.0001), there is a correlation between working period with a hearing loss of workers Loom part Weaving AJL Department (p = 0.0001).

Keywords: *Age, years of service, hearing loss, noise.*

Introduction

Occupational hazards are classified into several types, one of which physical hazards such as noise. Noise that exceeds the threshold value >85 dBA can cause hearing loss. Hearing loss is directly proportional to age, and reaches its peak at the age of 25 years, with increasing age it is followed by a decrease in physical capacity such as decreased hearing[1].

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A person's hearing power in capturing sound is influenced by internal and external factors. Of the various factors that can affect the hearing threshold, the most prominent in internal factors are age and external factors, namely the length of exposure to noise[2]. Based on research, results showed no correlation with age and years of hearing threshold value of workers exposed to noise in the Steel Melting Shop production unit of PT. X Sidoarjo[3].

PT Bintang Asahi Textile Industry or in short with PT BATI is a company that is in the area of Sragen and engaged in the textile field. The production process at PT BATI using machines that could potentially cause noise, one of its engines on the Loom Weaving AJL Department. Workers in the Loom Weaving AJL Department work for 8 hours in a day.

Based on the preliminary survey to measure the noise level at the Loom at two points, the result of measurement exceeds the threshold limit value (85 dBA).

At a noise level of >85 dBA after a 10-year work period workers will experience hearing loss[4]. While the results of interviews with 15 workers Loom part Weaving AJL department in PT Bintang Asahi Textile Industry with tenure below 10 years, there were seven workers have a hearing loss. The purpose of this study was to analyze the relationship between age and years of service to the hearing impaired workers exposed to noise exceeding the threshold limit value at the Loom part Weaving AJL Department in PT Bintang Asahi Textile Industry.

Research Method

This type of research is quantitative analytic using cross sectional design. The population in this study were all employees of section Loom part Weaving AJL department in PT Bintang Asahi Textile Industry with the number of 156 workers and obtained a sample with the number of 71 respondents. The sampling technique in this study is simple random sampling where each population has the same chance to be selected as a sample.

The variables in this study consisted of two variables, namely the independent and dependent variables. The independent variables in this study were age and years of service workers Loom part Weaving AJL department, and the dependent variable in this study is hearing impaired workers Loom part Weaving AJL department. While confounding variables were measured in this study is the intensity of the noise at the Loom part Weaving AJL department.

Collecting data on age and years of using a questionnaire, hearing loss using audiometric tool and noise using a sound level meter. The research was conducted during the hours after work in accordance with the work shift respondents. For the morning shift it takes place at 14.00, for the afternoon shift at 22.00, and the night shift at 06.00. while the noise measurement was carried out at 10:00. Data analysis using computerized statistical programs included univariate analysis and bivariate analysis.

Findings:

Table 1. Measurement Method

Measuring Point	Noise Measurement Result (dBA)
Point I	86.93
Point II	87.25
Point III	87.46
Point IV	87.77
Point V	87.88
Average	87,45

Based on Table 1, results in the lowest measurement point 1 to the value of 86.93 dBA. While the results of the highest measurement at the point to 5 with a value of 87.88 dBA. With an average overall measurement result is 87.4 + 0.325. The results of measurements of noise at the Loom part Weaving AJL department Textile Industry PT Bintang Asahi show all >85 dBA, these results do not match or exceed the Threshold Limit Value has been determined.

Table 2. Age of Respondents

Respondents Age	Frequency	Percent
28	4	5.6
29	1	1.4
30	3	4.2
31	1	1.4
32	6	8.5
35	1	1.4
36	1	1.4
37	1	1.4
38	1	1.4
39	2	2.8
41	2	2.8
42	9	12.7
43	1	1.4
44	7	9.9
45	4	5.6
46	1	1.4
47	2	2.8
48	7	9.9
49	2	2.8
50	1	1.4
51	2	2.8
52	5	7.0
54	1	1.4
62	1	1.4
Total	71	100

Based on Table 2, the oldest age is 62 years only one person with a percentage of 1.4%, while the youngest age is 28 years and as much as 4 respondents with a percentage of 5.6%. The average age of respondents overall was 41.80 + 7.5 years.

Table 3. Respondents Work Period

Years of Service Respondents	Frequency	Percent
3	6	8.5
4	3	4.2
5	1	1.4
6	3	4.2
7	5	7.0
8	7	9.9
9	3	4.2
10	5	7.0
11	6	8.5
12	5	7.0
15	5	7.0
16	5	7.0
17	3	4.2
18	10	14.1
19	1	1.4
20	1	1.4
23	1	1.4
27	1	1.4
Total	**71**	**100**

Based on Table 3, the longest tenure at 27 years only 1 respondent with a percentage of 1.4%, while the most recent period of employment is 3 years as many as 6 respondents with a percentage of 8.5%. The average tenure is 11.58 + 5,518 years.

Table 4. Hearing loss respondents

Listen Threshold (dB)	Frequency	Percent
7.50	2	2.8
8.75	3	4.2
9.37	1	1.4
10,00	1	1.4
10.62	4	5.6
11.00	1	1.4
11.25	1	1.4
14.37	2	2.8
15,00	1	1.4
20.00	1	1.4
21.25	1	1.4
22.00	1	1.4
23.12	1	1.4
26.87	2	2.8
28.00	2	2.8
28.12	2	2.8
28,50	1	1.4
28.75	2	2.8
28.87	1	1.4
30.00	1	1.4
30.62	1	1.4
30.87	1	1.4
31.25	1	1.4
32.30	1	1.4
32,50	2	2.8
33.12	2	2.8
33.75	2	2.8
34.37	2	2.8
35.00	2	2.8
35.62	1	1.4
36.87	1	1.4
37.50	1	1.4
38,12	1	1.4
38.75	1	1.4
39.37	2	2.8
40.62	1	1.4
41.12	1	1.4
41.25	1	1.4
41.87	1	1.4
43.12	2	2.8
43.75	1	1.4
44.75	1	1.4
45.00	1	1.4
46.87	1	1.4
47.50	1	1.4
49.37	3	4.2
52,50	1	1.4
54.37	1	1.4
54.95	1	1.4
56.25	1	1.4
68.12	1	1.4
Total	**71**	**100**

Based on Table 4. The results of the hearing level measurement section worker Loom Weaving AJL Department highest value of 68.12 dB measurement only 1 respondent with a percentage of 1.4%, while the lowest is the measurement results are 7.50 dB 2 respondents with a percentage of 2.8%. The average yield of the overall measurement of hearing that is 31.09 + 14.16 dB.

Table 5. Test Results Minimum Relations with Hearing Loss

Variables	Average	Significance
Age	41.80	0.0001
Hearing disorders	31.09	

Based on Table 5, the results of the Person Product statistical test show a significance of 0,0001 <0,05, which means that Ho is rejected so there is a social relationship with hearing loss in the Loom part Weaving AJL Department at PT Bintang Asahi Industrial Textiles. The strength value of the relationship between age and hearing loss was 0.574 (strong relationship strength).

There are studies that suggest that there is a significant relationship between age and hearing threshold value of respondents surveyed. These results indicate a p-value of 0.000, which means there is a relationship or correlation between age and the Threshold Limit Value[3]. In another study states that there is a relationship between age and degree of hearing loss right ear (p = 0.046), left ear (p = 0.042), and the degree of deafness double ear (p = 0.006) in residents around highways exposed to noise[5].

Table 6. Test Results Work Period Relations with Hearing Loss

Variables	Average	Significance
Years of service	11.58	0.0001
Hearing disorders	31.09	

Based on Table 6, the results of statistical test showed Person Product Significance value of 0.0001 <0.05, which means that Ho is rejected so that no future relationship with a hearing loss of workers working Loom part Weaving AJL Department in PT Bintang Asahi Textile Industry. Rated strength of the relationship between working life with a hearing loss is 0.493 (the strength of the relationship is strong enough). The correlation is in line with the results of the correlation between working period with a hearing loss of 0,455, the correlation results are also included in the category strong enough[4].

The results are consistent with the theories and studies that have been done, including the theory that suggests that the tenure effect on hearing threshold value of labor. increase in hearing threshold on the working life group> 10 years higher than the working age group <10 years[1]. While the research results are consistent with research that has been done the results show that there is a relationship between length of service with NIHL events at home exhaust industry workers in Sub Purbalingga Lor[6].

Based on the results of interviews with workers in the Loom section of the AJL Weaving Department, many workers complained about the effects of engine noise such as the disruption of communication with other workers, the feeling of always wanting to get angry, and decreased hearing. The main effect of working continuously on a noisy environment will be uplifted to health, namely damage to the auditory senses caused by loud sounds such as the sounds of production machines.

Other factors that can affect hearing loss is the use of ear protection device. PT Bintang Asahi provide ear protective devices such as earplugs in the form of lumps of fabric, wherein the fabric blob should be used during the job. The control efforts that can be made with the conditions at PT Bintang Asahi Textile Industry on noise levels include engineering through good maintenance of equipment such as checking machines every day, giving lubricants on the moving parts so that lubricant can function to muffle the noise of the machine being move, and put a damper with rubber pads so that noise caused by vibration and machined metal parts, rubber pads mounted on moving machine parts fall so that the noise can be controlled with the rubber pads. PT Bintang Asahi Industrial Textiles has not provided ear protectors that comply with the standards of health and safety of its workers, making efforts to provide protective equipment such as ear earplug and earmuff is required by PT Bintang Asahi Textile Industry to maintain the health of their workers. Efforts to control the rotation of workers who enter the category of elderly age early and exposed to noisy exceeds the threshold limit value, can be moved on a part that has a low noise level.

Conclusion

The average age of the respondents, 41.80 ±7.593 years, with the difference in age is 28-62 years. The average tenure of respondents ie 11.85 + 5,518 years, with the difference in working period is 3-27 years. The hearing threshold measurement results with the average respondent is 31.09 ± 14.16 dB, the difference in hearing threshold respondents are from 7.50 to 6.18 dB. The average results of measurements of noise intensity is 87.45, the value is> 85 dBA exceed the Threshold Limit Value (TLV), by a margin of 86.93 to 87.88 dBA. Statistical test results in getting the relationship between

age with hearing loss of workers with significant value of 0.0001 and a correlation value of 0.574 (strong) statistical test results in getting the relationship between working life with a hearing loss of workers with significant value of 0.0001, and the results a correlation of 0.493 (strong enough).

Conflicts of Interest: All authors have no conflict interest to declare.

Source of Funding: The source of the research cost from self.

Ethical Clearance: The study was approved by the institutional Ethical Bord of the Muhammadiyah Surakarta University, Faculty of Health Sciences, Publict Health, Study Program.

All subjects were fully informed about the procedures and objectives of this study each subject prior to the study signed an informed consent form.

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Health Literacy on Weighing Control and Use of Weight Loss Products among Working-age Women in the Northeast of Thailand

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Abstract

This cross-sectional study aimed to describe weight loss products' use patterns and identify the association of health literacy on weight control and weight loss products use among working-age women in the Northeast of Thailand. The study was conducted among 1,190 respondents who were multistage randomly selected from 4 provinces of the Northeast region. Data were collected using a self-administered structured questionnaire. The generalized linear mixed model (GLMM) was used to identify the association between health literacy and weight loss products use when controlling the effects of other covariate presenting adjusted OR and 95% confidence interval. The results indicated that 23.19% (95% CI = 20.79-25.59) of the respondents ever used weight loss products, of which 11.60% (95% CI = 9.77-13.41) were current users. Levels of health literacy on weight control was statistically significant with weight loss products use including having; sufficient level of health literacy (adj. OR = 2.62: 95% CI=1.59-4.31, p-value <0.001), problematic level of health literacy (adj. OR = 4.71: 95% CI=2.87-7.72, p-value <0.001) and inadequate level of health literacy (adj. OR = 10.97: 95% CI=6.17-19.51, p-value <0.001) when compared with having excellence level. The significant covariate was had waist circumference ≥ 80 cm. (Adj. OR = 4.12: 95% CI = 2.79-6.11, p-value =0.025), finished lower than bachelor degree (adj. OR = 2.11, 95% CI = 1.78-3.70, p-value <0.001), had average monthly income ≥ 15,000 THB =(adj. OR = 3.08: 95% CI = 2.20-4.31, p-value <0.001), About twenty three percent of working-age womenever used weight loss products. Health literacy was highly associated with used weight loss products.

Keywords: *Weight loss products, Health literacy, working-age women.*

Introduction

Overweight and obesity cause various health problems all over the world[1], obesity particular is one of the main causes of morbidity and mortality[2] especially cardiovascular disease (CVD). Awareness of the serious health consequences, people turn their attention to weight control to be within the standard[3]. It is wildly accepted that lifestyle modification, such as healthy dietary habits and regular physical activity is necessary for weight control, however, with a long term effort [4]. Therefore, many people use various weight loss products because they are quicker and easier than exercising or dieting[5]. Although this method is dangerous or has many side effects[6], as well as being unable to confirm the weight loss results as to whether or not effective[7]. The main target groups of these products are working women[8]. Because they are a person with financial readiness, able to make independent purchase decisions and pay attention to the shape[9].

Health literacy is linked to the ability of individuals to understand and apply health information to practice for disease prevention and health promotion[10]. People with an excellent level of health literacy should be less likely to use weight loss products since they are well aware of their complications than those with inadequate

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health literacy. Social-cognitive factors also play an important role in behavioral determination[11].

Although different health behavior theories have been used to explain weight management, roles of social-cognitive factors on weight loss remain poorly understood[12]. Also, there is limited evidence concerning the influence of socio-demographic gradients on dieting and attempts at weight loss[13] such as women are more likely to concern about their shape.

The Northeastern region of Thailand is the biggest region both in terms of areas and population. Most of the labor forces of the country are from this region. With the long term continuously economic expansion, there has been an increasing trend of overweight and obesity among northeasterner women. Therefore it is essential to the determinants of weight loss products use among them.

Objective: To describe the weight loss products use and identify the association between health literacy on weight control and weight loss products use among working-age women in the Northeast of Thailand.

Materials and Method

This cross-sectional study was conducted in 2019. The population was working-age women aged 20 to 59 years old in the Northeast of Thailand. The sample size was calculated by using the sample size estimation formula for the logistic regression analysis of Hsieh[14]. The estimated sample size was 1,190. The respondent was recruited from 4 provinces of the Northeast of Thailand by using multi-stage random sampling method to respond to a structured questionnaire.

Data Analysis: All analyses were performed using Stata version 10.0 (Stata Corp, College Station, TX). Descriptive statistics including frequency and percentage to describe categorical data whereas mean, standard deviation, median, and maximum-minimum for continuous data. A simple logistic regression was used to identify individual the association between each independent variable and weight loss products use. The independent factors that had p-value <0.25 [15] were processed to the multivariable analysis using the generalized linear mixed model (GLMM) to identify the association between health literacy and weight loss products use when controlling the effect of other covariates, of which 4 provinces were selected to include as random effects. The magnitude of association was presented as adjusted odds ratio (Adj. OR), 95% confidence interval (CI) and p-value <0.05 as statistical significant level.

Result

Socio-demographic: The average age of the respondents was 39.46 ±10.71 years old, 58.74 were married, 67.15 percent had education lower than a bachelor's degree. the occupation was employee 25.04 percent, an average monthly income 10,000-19,999 baht, average monthly expenditures less than 10,000 baht, normal body mass index 40 percent, waist circumference exceeds the standard threshold 50.25 percent without chronic disease 86.47 and healthy status of 81.26 percent.

Almost a quarter of the respondents ever used weight loss products (23.19% : 95% CI = 20.79-25.59) of which 11.60% (95% CI = 9.77-13.41) were current users. The most common type of weight loss product use were diet pills which were consumed by 7.84% of the respondents, followed by diet coffee (6.68%) and fiber products (4.50%), see table 1.

Table 1: Number and percentage of weight loss products use pattern (n = 1,190 people)

Weight loss products use pattern	Number	Percent
1. Weight loss products use		
Currently, use	138	11.60
Used for less than 6 months and stop using	39	3.28
Used for more than 6 months and stop using	99	8.32
Never used but would like to use in the future	90	7.56
Never used and want to use	824	69.24
2. Type of weight loss product use (Can answer more than 1 question)		
Diet pills	101	7.84
Diet coffee for weight loss	86	6.68
Fiber products	58	4.50
Konjac Extract	55	4.27
Wearable products for weight loss	12	0.93
Tea products	11	0.85
A traditional procedure such as massage	10	0.78
Chitosan	9	0.70
Weight loss program	8	0.62
Equipment	7	0.54
Garcinia extract	5	0.39

Weight loss products use pattern	Number	Percent
Increased metabolism products	4	0.31
Other weight loss products	8	0.62
Do not use weight loss products	914	70.96

Association between health literacy and weight loss products use among northeastern working women when controlling other covariates: A multivariable analysis: Association between health literacy and weight loss products use among northeastern working women were identified by using the Generalized Linear Mixed Model (GLMM) to control the clustering effect in each health zone. The results indicated that levels health literacy were associated with weight loss products use including had sufficient level of health literacy (adj. OR = 2.62 :95% CI=1.59-4.31, p-value <0.001), had problematic level of health literacy (adj. OR = 4.71:95% CI=2.87-7.72, p-value <0.001) and had inadequate level health literacy 10.97 times the use of weight loss products for those with excellent health literacy (adj. OR = 10.97: 95% CI=6.17-19.51, p-value <0.001) when compared with those with excellent level of health literacy. The other significant covariates were, those with waist circumference ≥ 80 cm. (adj. OR = 4.12: 95% CI = 2.79-6.11, p-value =0.025), graduated bachelor degree or higher (adj. OR = 2.11,95% CI = 1.78-3.70, p-value <0.001), had average monthly income ≥15,000 THB (adj. OR = 3.08:95% CI = 2.20-4.31, p-value <0.001), see Table 2.

Table 2: Association between health literacy and weight loss products use among northeastern working women when controlling other covariates: a multivariable analysis using GLMM

Factors	Number	Percent	Crude OR	Adj. OR	95% CI	P-value
Health literacy						
Excellent	320	9.69	1	1	1.60-4.24	<0.001
Sufficient	407	18.92	2.17	2.61	2.88-7.61	<0.001
Problematic	331	30.32	4.15	4.68	6.04-18.62	<0.001
Inadequate	132	50	9.32	10.6		
Education Level						
≥ Bachelor Degree	391	18.41	1	1	1.78-3.70	<0.001
<Bachelor Degree	799	25.53	1.52	2.57		
Income per month (THB)						
<15,000	667	15.59	1	1	2.20-4.31	<0.001
≥15,000	523	32.89	2.65	3.08		
Waist circumference(cm.)						
<80	588	10.54	1	1	4.48-8.98	<0.001
≥80	602	35.55	4.68	6.31		

Discussion

This present study observed that about 23% of working-age women ever used weight loss products. This proportion was a little lower than those found in a study in 2015 in Bangkok, Thailand indicated that 27.7% of the respondents used weight loss products[16]. However, it was higher than those found in a study in 2017 in Ratchaburi Province, Thailand that observed that 19.6% of the participants used weight loss products[17]. A possible explanation was that there was a higher level of economic development in Bangkok, people have higher income and might concern about shape more than the northeasterners. Ratchaburi, on the other hand, had a lower income. The multivariable analysis of this study also indicated that higher income had a high influence on weight loss products use (adj. OR = 3.08) which was similar to a study in Sweden [13].

Health literacy (HL) played an important role in weight loss products use. Our finding indicated that those who had excellence level of health literacy on weight control were less likely to use weight loss products when compared to those who had sufficient, problematic, and inadequate levels of HL (adj. OR= 2.61, 4.68, and 10.60 respectively). A study of Cheong et all. Indicated that

HL had a positive impact on weight loss behaviors. There was also evidence that interventions focusing on improving knowledge and HL skills could effectively control the weight[18]. HL influences reach and moderates weight effects. These findings underscore the need to integrate recruitment strategies and further evaluate programmatic approaches that attend to the needs of low-HL audiences. HL is necessary and an important indicator when making decisions about weight loss products. Having HL can influence the choice and decision not to use weight loss products. Therefore, encouraging the public to have good HL will help people to avoid using weight loss products and choose to use the right weight control[19].Our finding also observed that there were socioeconomic gradients to overall health and showed that those with lower levels of education had poorer health and higher mortality. A previous study of Barbering et.all[13] also indicated that proper dietary regimen and overweight were associated with higher education levels. Similarly a studied of Ball observed that males who were married, living in households with shared income and who had less education were more likely to use weight loss products[20]. Waist circumference(WC) is one of the conditions of metabolic syndrome, which is an important risk factor of cardiovascular disease[21]. Women with higher WC have a bigger belly which made them looked fat. This might lead to more concern about weight loss. They might try to reduce the WC as quick as possible by using weight loss products[22]. Therefore, it requires effective measures to improve health literacy on appropriate weight control especially among those with lower education having a big belly and had a higher income that has more purchasing power.

Conclusion

The study indicated that about 23 percent of working-age women ever used weight loss products. Health literacy was highly associated with used weight loss products when considering the influenced of waist circumference, educational level, and income.

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Conflict of Interest Statement: The authors declare that there is no conflict of interest.

Ethical Clearance: The written informed consent was taken from all the individuals after explaining the study objectives. The Ethical Committee of KhonKaen University approved this study (reference no. HE 622008).

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Awareness Regarding Heart Diseases among Middle Aged Adults in a Rural Area of Rupandehi District

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Abstract

Cardiovascular diseases (CVDs) are the number one cause of death globally. Lack of awareness about CVDs risk can lead to delays in seeking treatment and increased risk for sudden death. This study was conducted to assess the awareness on heart diseases among middle-aged adults in a rural area of Rupandehi district, Nepal. Descriptive cross-sectional study was conducted among 107 middle-aged adults of Shudhodhan rural municipality, Rupandehi district. The samples were selected by non-probability purposive sampling technique. Pretested and pre validated semi-structured questionnaire was used for data collection. The data was analyzed using SPSS 16.0 version. More than half of the respondents (55.14%) had high level awareness on heart disease. About 71.03% had family history of heart diseases. Regarding risk factors of heart diseases cent percent respondents were aware of alcoholism,98.13% were aware of smoking, 47.66% were aware of family history and 14.02% were aware of menopause. 99.07% respondents were aware of elevated blood pressure and chest pain as cardinal symptoms of heart diseases. The study reveals that respondents had low awareness on family history as risk factor of heart diseases whereas there is statistically significant association between family history of respondents and level of awareness regarding heart disease (p=0.002). Respondents (14.02%) also had low awareness on lifestyle changes with medicines as management of heart disease. Hence it is necessary to educate people about heart diseases risk factors and lifestyle changes for management and prevention of heart diseases.

Keywords: *Awareness, heart disease, middle-aged adults.*

Introduction

Cardiovascular diseases (CVDs) are disorders of the heart and blood vessels and they include coronary heart disease, rheumatic heart disease, congenital heart disease and other conditions. Triggering these diseases-which manifest primarily as heart attacks and strokes-are tobacco use, unhealthy diet, physical inactivity and harmful use of alcohol. An estimated 17.9 people died from CVDs globally in 2016, representing 31% of all global deaths and 85% of all CVD deaths are due to heart attacks and strokes. Over three quarters of deaths take place in low- and middle-income countries.[1]

In Nepal from 2005 to 2015, the ischemic heart disease increased around 25.3% and Coronary heart disease reached 10.79% of total deaths.[2] About 40% of non-communicable admissions are due to CVDs.[3] These facts create as enormous social burden reducing labour productivity and creating an overcharge of public fees, in a country with a poor healthcare system and a feeble economy. The earthquakes of 2015 also imposed critical social and epidemiological effects to the population resulting in lifestyle changes.[4]

A government data has shown that 99.6% of the Nepali population is at the risk of contracting cardiovascular diseases. The national survey carried out by the Health Research Council has recently found that a majority of people has one or more risk-factors

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including tobacco use, alcohol consumption, low fruit and vegetable consumption and physical inactivity that pose a threat for disease. Biological factors such as obesity, high blood pressure, high blood glucose level and abnormal lipids also contribute to the risk of the disease.[5]

The aim of the study was to assess the awareness on heart diseases among middle-aged adults in a rural area of Rupandehi district, Nepal.

Material and Method

Descriptive cross-sectional design was used for the study to find out awareness regarding heart disease in middle-aged adults.The study was conducted in Shudhodhan rural municipality, ward number 2, Rupandehi district, Nepal.The total population residing in thisrural municipality is 8,865. Total 107 samples were selected using purposive sampling technique. Interview schedule was used for data collection with use of pretested and prevalidated semi-structured questionnaire, developed by researchers. There were 22 questions regarding heart diseases. Data was collected in between April to September, 2017. Administrative and ethical approval was obtained from concerned authorities prior to data collection. The researchers contacted each respondents, written informed consent for the study was obtained and interviewed. Descriptive statistical method was used with SPSS 16 version to analyze data using frequency, percentage and mean.

Resuits

As shown in table 1,out of 107 respondents, 40.19% of respondents belong to 40-46 years and 21.50% belong to 54-60 years of age. Similarly 56.07% respondents belong to female gender. Regarding educational status, 50.47% respondents are literate. As regard to occupation, 40.19% of respondents are homemakers. Majority of respondents (71.03%) had family history of heart diseases.

Table 1: Respondents' Socio-demographic Variables n=107

Variables	Frequency	Percentage
Age		
40-46years	43	40.19
47-53 years	41	38.32
54-60 years	23	21.5
Gender		
Male	47	43.93
Female	60	56.07
Educational Status		
Literate	54	50.47
Illiterate	53	49.53
Occupation		
Business	18	16.82
Farmer	34	31.78
Service holder	10	9.35
Homemaker	45	42.06
Family History		
Yes	76	71.03
No	31	28.97

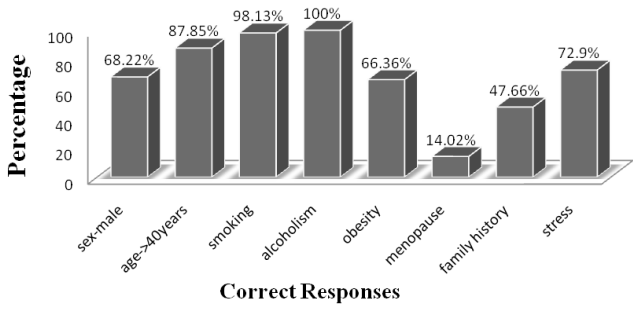
From the table 2 below, more than half of the respondents 59 (55.14%) had high awareness and others 48 (44.86%) had low awareness regarding heart diseases.

Table 2: Respondents' Overall Awareness Regarding Heart Disease n = 107

Level of Awareness	Frequency	Percentage
High	59	55.14
Average	-	-
Low	48	44.86

Mean awareness score=14.35, Total score=20

Out of 107 respondents, cent percent answered alcoholism, 98.13% answered smoking and minority answered family history (47.66%) and menopause (14.02%) as risk factors of heart diseases as shown in graph 1 below.



Graph 1: Respondents' Awareness Regarding Risk Factors of Heart Disease

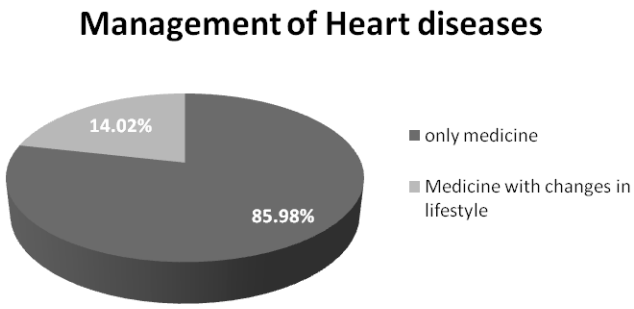
Regarding to cardinal symptoms awareness, majority of respondents (99.07%) answered elevated blood pressure and chest pain and minority (44.86) answered extreme fatigue as shown in table 3.

Table 3: Respondents' Awareness Regarding Cardinal Symptoms of Heart Diseases n = 107

Cardinal Symptoms**	Frequency	Percentage
Elevated blood pressure*	106	99.07
Chest pain*	106	99.07
Palpitation*	56	52.34
Back pain	10	9.35
Muscle rigidity	9	8.41
Extreme fatigue*	48	44.86

*Correct response, **Multiple responses

As regard of management of heart diseases shown in graph 2 below, out of 107 respondents, 85.98% answered only medicine and minority (14.02%) of respondents answered medicine with change in life style. 17.6% of respondents answered there is free treatment of heart disease from Government.



Graph 2: Respondents' Awareness Regarding Treatment of Heart Disease

Table 4 below shows the association between family history and awareness level on heart diseases. It shows that there is statistically significant association between family history of respondents level of awareness regarding heart disease.

Table 4: Association between Family History of Respondents and Level of Awareness Regarding Heart Disease

Variables	Level of Awareness		X^2	p-value
	High (%)	Low (%)		
Family History				
Yes	36 (47.37)	40(52.63)	6.47	0.002
No	23(74.19)	8(25.81)		

Significance level at 0.05

Discussion

The findings of the present study reveal that more than half of the respondents that is 55.14% had high level of awareness on heart disease which is consistent with the findings of study conducted by Tecla et al. (2015) in Western Kenya which showed that 58% of the respondents had knowledge regarding heart disease.[6]

The findings of the study showed that 68.22% of respondents had awareness about sex, 87.85% were aware about age as non-modifiable risk factors of heart disease which is not consistent with the findings of study conducted by Acharya et al. (2012) in Kathmandu which showed 13.8% knew about sex and 46.9% knew age as risk factors of heart disease.[7]

The findings of the study showed that 47.66% of respondents had awareness about family history as risk factors of heart disease which is consistent with the findings of study conducted by Aharyaet al. (2012) in Kathmandu which showed 46.9% respondents knew about family history as risk factor of heart disease.[7]

The findings of the study showed that 98.13% respondents are aware about smoking, 66.36% are aware about obesity and 72.9% knew stress as risk factors of heart disease which is not consistent with the findings of study conducted by Acharya et al. (2012) in Kathmandu which showed that 70.4% respondents are aware of smoking, 58.8% knew obesity and 63.7% knew stress as risk factors of heart disease.[7]

The findings of the study showed that 99.07% of respondents had awareness regarding chest pain as cardinal symptoms of heart disease which is not consistent with the findings of study conducted by Aharya et al. (2012) in Kathmandu which showed 24% knew about chest pain as cardinal symptoms of heart disease.[7]

The findings of the study showed that 24.30% of respondents had awareness regarding medicine with change in lifestyle as treatment of heart disease which is not consistent with the findings of study conducted by Ingvar et al. (2007) in Sweden which showed 48% knew medicine with change in lifestyle as treatment of heart disease.[8]

Conclusion

More than half of the respondents had high level awareness on heart disease. The study reveals that respondents had low awareness on family history, menopause as risk factor of heart diseases whereas there is statistically significant association between family history of respondents and level of awareness

regarding heart disease (p=0.002). Respondents also had low awareness on lifestyle changes with medicines as management of heart disease. Hence it is necessary to educate people about heart diseases risk factors and lifestyle changes for management and prevention of heart diseases.

Conflict of Interest: Authors of this manuscript declare that there is no conflict of interest.

Source of Funding: Self.

Ethical Clearance: It was taken from concerned authority that is Institutional Review Committee, Universal College of Medical Sciences and Teaching Hospital, Tribhuvan University.

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Correlation of Osteocalcin Urine Levels with Bone Mass Density in Menopause Women in H. Adam Malik General Hospital Medan

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Abstract

Aim: This research is expected to revealed the correlation between urinary osteocalcin and bone density in menopausal women.

Method: Descriptive study with case series design, conducted at Department of Obstetrics and Gynecology H. Adam Malik General Hospital Medan and Integrated Laboratory of Medical Faculty, University of North Sumatra and Setia Budi Hospital for DEXA Scan measurements in January 2019. The research sample was taken by 21 menopausal women using non-probability sampling with consecutive sampling techniques. Analysis of the correlation of urinary osteocalcin with bone mass density using Pearson correlation.

Results: The mean value of urinary osteocalcin in women with normal bone mass density was 6.67 ± 0,53 and the mean value for the osteopenia group was 9.05± 1.30. The results of the Pearson correlation showed a r score -0.803 and p <0.001. In this research shows that the higher level of urinary osteocalcin, the lower the T score.

Conclusion: This research shows a significant negative correlation of urinary osteocalcin levels with bone mass density (T score) in menopausal women.

Keywords: *Osteocalcin, Bone Mass Density, Menopause, DEXA, Osteoporosis.*

Introduction

Menopause is cessation of menstruation in 12 months. Post menopause is time after menopause. Menopausal transition is time when irregularity of menstruation occur after 12 months forward. Average age of menopause is 51,5 years old.[1]

Estrogen deficiency will cause a disruption of bone remodeling that will cause osteoporosis in postmenopausal women. This will cause loss of bone mass and bone quality. Increased secretion of osteoclastogenic cytokines such as interleukin-1 (IL-1), interleukin-6 (IL-6), and tumor necrosis factor (TNF-α), imbalance in RANKL/OPG gene expression, and inhibition of osteoclast apoptosis are several mechanisms in osteoporosis.[2,3,4]

Bone Mass Density (BMD) is a standard for

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measuring bone mass and is assessed using Dual Energy X-ray Absorptiometry (DEXA) in the lumbar, radius, and femur. According to WHO, to diagnose osteoporosis, a T score can be used which osteoporosis is defined by BMD> -2.5.[1]

Osteocalcin also has several properties, namely in the normal state of kidney function, osteocalcin and fragments will be cleared quickly by the kidneys and contribute to free Gla in the urine. However, in the case of kidney failure, these fragments accumulate and can be detected. Problems related to circulating osteocalcin instability (S-OC) after sampling tend to be less severe than urinary osteocalcin (U-OC), which is thought to be the final product of fragmentation.[5]

Serum OC levels can be detected by various tests, such as tests using monoclonal antibodies to OC N-mid and OC N-terminals fragments. Lack of calcium and phosphorus in women with osteoporosis decreases the formation of hydroxyapatite crystals, which make osteocalcin free circulating in the blood. This explains the increasement of concentration of serum OC levels in postmenopausal women who have osteoporosis.[6]

From the research of Rusda M in 2016, there was a positive correlation between serum estradiol and T score with r = 0.53. This shows that BMD is reduced in postmenopausal women who have osteoporosis compared with nonosteoporosis due to decreasement of estrogen levels as the main etiology in postmenopausal women. Calcium and phosphate deficiency in osteoporosis women decreases the formation of hydroxyapatite crystals, which causes osteocalcin to circulate freely in the blood. This explains the high concentration of osteocalcin in menopausal women. This can be taken into consideration that osteacalcin can be used to detect low Bone Mass Density (BMD) conditions.[7,8,9,10]

Material and Method

This is a descriptive study with a case series design to examined the correlation of urinary osteocalcin levels with bone mass density in 21 menopausal women which is conducted at Department of Obstetrics and Gynecology H. Adam Malik General Hospital in Medan which takein using non-consecutive sampling, while for urine osteocalcin examination performed at the Integrated Laboratory of Medical Faculty, University of North Sumatra and Setia Budi Hospital for DEXA Scan measurements. This research was conducted in January 2019.

Work Arrangement: After obtaining approval from the ethics commission to conduct research, research begins with collecting samples. Body Mass Index (BMI) was measured, then measurement of L2-L4 lumbar bone mass density using Dual Energy X-Ray Absorptiometry (DEXA). For measurement of urinary osteocalcin levels, the N-MID Osteocalcin (N-MID-OT) ELISA kit is used. Urine Osteocalcin (U-OC) levels were measured by quantitative ELISA using the manufacturer's instructions and using a central portion of urine taken in a 24-hour period. 100 µl of reagent and urine osteocalcin are mixed, covered with adhesive, incubated for 2 hours at 37 ^{o}C. Pipette layouts are prepared to measure standard solutions and samples. The liquid in each pipette is removed, but not washed.

Statistical Analyzed: Data were analyzed descriptively to see the frequency distribution of research subjects based on characteristics. To analyze the relationship of urine osteocalcin with bone mass density, the data were analyzed by Pearson correlation. The results of the analysis are said to be significant if p <0.05 with a 95% confidence level. Data analysis using SPSS version 20.

Results

The description of the research subjects characteristics based on age, bone mass density, and body mass index can be seen in the table below.

Table 1: Frequency Distribution Based on Sample Characteristics

Variable	n (21 person)	Persentage (%)
Age		
50-55 years old	3	14,3
56-60 years old	10	47,6
61-65 years old	8	38,1
Body Mass Index		
Underweight	1	4,8
Normoweight	7	33,3
Overweight	5	23,8
Obesity	8	38,1
Menopause Duration		
1-2 years old	4	19,0
2-4 years old	7	33,3
≥ 5 years old	10	47,6
Total	**21**	**100**

Characteristics of research subjects based on majority which is age56-60 years as many as 10 subjects

(47.6%),normoweight as many as 7 subjects (33.3%) and menopausal duration ≥ 5 years as many as 10 people (47.6%).

Table 2. Frequency Distribution of Characteristics and Average Bone Mass Density in Menopausal Women

Bone Mass Density	n	Per. (%)	Mean	SD
Normal	10	47,6	-0,47	± 0,56
Osteopenia	11	52,4	-1,51	± 0,29
Total	**21**	**100**		

The characteristics of the subjects are based on Bone Mass Density, osteopenia group as many as 11 people (52.4%). While the mean bone mass density in the normal group was -0.47 ± 0.56 and the osteopenia group was -1.51 ± 0.29.

Table 3. Mean Value of Urine Ostocalocalcin based on Bone Mass Density in Menopausal Women

Osteocalcin	Mean	SD
Normal	6,67	± 0,53
Osteopenia	9,05	± 1,30

Mean value of urinary osteocalcin in women with normal bone mass density was 6.67 ± 0.53, the mean value for the osteopenia group of women was 9.05 ± 1.30.

Table 4. Correlation of Urine Osteocalcin with Bone Density in Menopausal Women

Parameter	R	P
Urine Osteocalcin Levels	-0,803	<0,001
T Score		

* Pearson Correlations

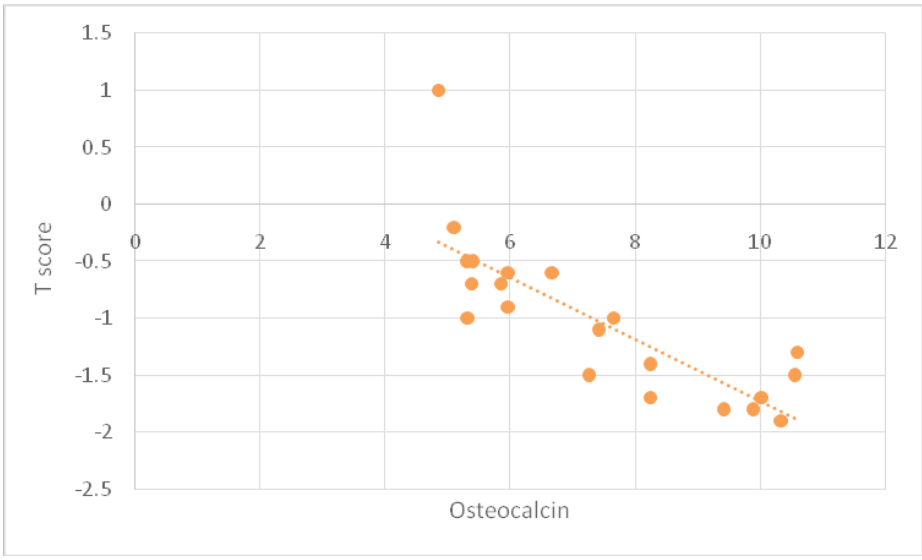

Figure 1. Osteocalcin Correlation Chart and T Score

From table 4., it was found that there was a significant negative correlation between urinary osteocalcin levels and T scores with r -0.803 and p <0.001. This shows that the higher the level of urinary osteocalcin, the lower the T score in this research.

Age: From the research of Hachul et al 2016, the mean age of menopause was 58.9 ± 0.8. From the study of Bjelland et al 2018, it was found that the average age was 56.7 years, and the study of Shadyab et al 2017 found an average of 74.7 years old research subjects, while the Banack et al study, 2018, found that the average age was 61 years old. In general, the age of menopause throughout the world is 50 years. Then, from studies in Thailand on postmenopausal women aged 50-54 years and 55-59 years, the prevalence of osteoporosis was 9.4% and 22.6%. The type of osteoporosis that occurs in postmenopausal women is the primary type. Where this is due to estrogen deficiency. Estrogen plays a role in osteoblast and bone mineral homeostasis. The older a woman is, the more she will lose bone mass density of about 50% of trabecular bone mass and 30% of cortical bone mass due to estrogen deficiency. [11,12,13,14,15]

Body Mass Index: This is in line with Bjelland et al 2018 study found that the average BMI was overweight with 25.8 kg/m^2, research Banack et al., 2018 found that the highest BMI data was in the overweight category with 26.7 kg/m2. Weight gain during old age is associated with a decrease in energy expenditure (EE), due to a decrease in physical activity, loss of body mass. Adipose tissue and weight will affect bone mass density as individuals with overweight and obesity BMI will have a greater body weight, weight will also affect bone peak mass, and adipocyte tissue in menopausal women will be converted to estron, so that postmenopausal women obesity will have more endogenous estrogen.[16,17,18,19, 20,21]

Menopause Duration: From Sarabi's research, 2018, it was found that the average menopause was 2.8 ± 1.5. Siregar Research, MFG, 2014, found that the average duration of menopausal women was 1-2 years from 50 samples (100%). From the study of Najmutdinova, 2016, the menopause duration of 0-3 years had a percentage of osteopenia of 36.2%, 4-7 years menopause duration has a percentage of osteopenia of 43.3%, and a duration of> 7 years has a percentage of osteopenia of 41.6%. Menopausal women with a menopausal duration of> 7 years have an increased risk of osteoporosis. Peak bone mass was achieved at the age of decade 30. In addition, the duration of menopause also has an impact on decreasing bone mass density, especially in the lumbar and distal radius. Menopausal women will experience a loss of bone mass 1-2% each year in a period of 5-10 years. Loss of bone mass is more common in the trabecular bone with a fracture of the vertebrae or distal radius. At the onset of menopause, there will be a loss of trabecular bone mass density of 1.8% and 2.3% in the vertebrae. After 5 years postmenopause, there will be a 7-10% decrease in bone mass density in the vertebrae.[4,18,24,26]

Bone Mass Density: From the Sarabi study, 2017, data was obtained that 35% of respondents were osteopenia. From the Montazerifar study, in 2014, there were 36.2% of subjects experiencing osteopenia, and Sahu's study, 2018, found that 72 research subjects (36%) were osteopenia groups The effect of estrogen will directly and indirectly suppress bone resorption. Where the dominant effect of estrogen is suppression of new osteoclast formations. modulates the Activator of Nuclear Factor kB (RANK) Receptor in osteoclasts and stimulates osteoclast apoptosis where RANKL plays a role in increasing osteoclast activity. But in menopausal women who experience a decrease in estrogen, bone mass loss, increased RANKL, inhibition of OPG, and increased production of cytokines such as IL-1, IL-6, and TNF-α. Estrogen deficiency will increase the production of TNF-α. by T. TNF-α cells will increase the production of RANKL and Macrophage Colony Stimulating Factor (M-CSF). Other cytokines that play a role are Inerleukin-7 (IL-7) which increases osteoclastogenesis. This will cause imbalance of resorption and bone formation, which will increase bone loss. Thus, an increase in RANKL after menopause will cause an increase in bone resorption and osteoporosis in menopause.[1,4,22,23,24,25,26]

Mean Value of Urinary Ostocalocalcin to Bone Mass Density: In the study of Singh et al, 2015, the mean serum osteocalcin level was 19.25 ± 5.1 ng/m. From the research of Zahrany et al 2014, there was a significant increase in osteocalcin levels in the osteopenia group of women compared to the control group, but there was no significant difference in osteocalcin levels between the osteopenia and osteoporosis groups. From these data it was also found that serum osteocalcin was 10% higher in the postmenopausal osteoporosis group. However, there are no data on the mean value of osteocalcin in urine with T scores.[19, 27]

Correlation of Urinary Osteocalcin with T Score: This shows that there is a significant relationship between urinary osteocalcin levels with T scores, namely the higher the level of osteocalcin, the T score will decrease further with a correlation value of 0.822. This is in line with the research of Singh et al, 2015 which obtained a negative correlation between osteocalcin and bone mass density with r = -0.527. From these research it was also found that osteocalcin can distinguish the normal bone density of postmenopausal women with low bone density in postmenopausal women. From the research of Zahrany et al 2014, it was found that there was a significant negative correlation between osteocalcin and bone mass density in postmenopausal women with r = -, 909. This shows that the higher bone turnover, the more loss of bone mass in osteoporotic women. Calcium and phosphorus deficiency in osteoporosis women will cause a decrease in the formation of hydroxyapatite crystals, which will cause osteocalcin to circulate freely in the blood. This can explain why osteocalcin levels increase in postmenopausal osteoporosis women.[19,6,27]

Conclusion

The mean value for urinary osteocalcin for bone mass density status in this research was the osteopenia

group with a mean of 9.05 ± 1.30. There is a significant negative correlation between urinary osteocalcin and bone mass density status in this research with r = -0.803 and p <0.001. This shows the higher the level of osteocalcin in the urine, the lower the bone mass density.

Conflict of Interest: The researcher ensures that there is no conflict of interest in this research.

Source of Funding: Self. There is no source of funding in this research.

Ethical Clearance: Research permission and approval were obtained from the Ethics Committee of the Medical Faculty, University of North Sumatra. Every research subject has the right to know the results of the examination conducted on him.

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Benefit of Thai Hermit Exercise on MCI Patients': A Randomized Controlled Trial

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Abstract

Background: Mild Cognitive Impairment (MCI) is a recurrent brain disorder with the memory. It is caused by the degeneration of the brain cells that is different from an individual's age and that develops to dementia. One way to help reduce stress is by exercising. Thai hermit exerciseis a wisdom in Thai exercise, which improves psychological status for this condition.

Method: This study was evaluated for a period of 10 weeks in regards to the Thai hermit exercise on psychological status among patients with MCI. 84 participants were recruited and randomized into intervention (n=42) control (n=42). The intervention group practiced Thai hermit exercise for 10 weeks. Psychological effect was evaluated by measuring the psychological status which was futher determined by the psychological status indicator questionaire. The control group received standard treatment. Both study groups were assessed by the test at the baseline then at 6th week, 8th week and 10th week of the study. Results: At baseline there were no significantly difference statistically between the two groups ($p<0.05$). After the intervention there were statistically significantly improvement of psychological status ($p<0.05$).

Conclusion: The results strongly suggested the capability of Thai hermit exercise to be a psychological effect for patients with MCI.

Keywords: *Mild Cognitive Impairment (MCI), Psychological status,Thai hermit exercise (ruesidatton).*

Introduction

Mild cognitive impairment (MCI) is defined as cognitive decline greater than what is expected for an individual's age and education level, which does not interfere with daily life activities[(1)]. For the people with aged 60 years and above, the reported prevalence of MCI rangedfrom 14 to 18% and the progression rate of dementia is about 5-15% per year[(2)]. Mental component - MCI behavior at getting unwitting, where it is a major predictor of tendency to become dementia and futheridentified two clusters neuropsychiatric symptoms, namely:

(1) Cluster frontal (aberrant motor behavior, disinhibition, agitation and problems of appetite), was found to be associated with functional disability even after controlling the cognitive status and the mood cluster scores.

(2) Cluster mood (including stress, depression, anxiety, apathy, irritability and sleep problems), is more common than frontal cluster of symptoms (95% of subjects had at least 1 symptom mood: 53% of subjects had at least 1 symptom frontal)

Stress requires one to use physiological and psychological energy to respond and adapt to the stressor with increased tolerance to stress reflecting early symptoms of dementia[(3)]. According to[(4),(5)] and [(6)]stress

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that takes place within a short time frame will disrupt the short term memory which is basically the verbal memory. Whereas when stress occurs long term and repeatedly, will result in the exposure to the hormone cortisol which becomes more frequent maycause shrinkage in hipoccampus and also trigger a further decline in the cognitive function that leads to dementia. Epidemiological research looking at the role of stress in neurodegenerative disease is still relatively small.

MCI risk factor have many causes which includes increased age, diabetes mellitus, smoking, depression, hypertention, and lack of physical activity[7]. The positive effect of physical activity on brain vascularity includes pressure reduction, improvement of the lipoprotein profile, increased perfusion which is direct on the brain through the preservation of the neuronal structure and major changes in plasticity in the hippocampus[8]. Finally, it has been reported that an active lifestyle with regular physical exercise may prevent distress and reduce in the cortisol levels[9]. It is also a known fact that even the slightest amount of physical activity done outside can improve posture, reduce stress and loneliness, sleeping better at night, and even preventing depression[10].

Thai hermit exercise (RuesiDatTon)is a traditional Thai healing technique that mainly consists of breathing exercises, self-massage, acupressure, dynamic exercises, poses, mantras, visualization and meditation which is similar to the Hathayogic practices. In recent years, the Thai Ministry of Public Health has published several books on ReusiDat Ton. According to these modern texts, some of the benefits of ReusiDat Ton practices include; improved agility and muscle coordination, increased joint mobility, greater range of motion, better circulation, improved in respiration, improved in digestion, assimilation and elimination, detoxification, stronger immunity, reduced stress and anxiety, greater relaxation, improved concentration and meditation, oxygen therapy to the cells, pain relief, slowing of degenerative disease and greater longevity. However, there are very few studies in people that have compared the effects of RuesiDat Ton practice on psychological status. Since no previous evidences regarding these aspects of the exercise that have been investigated, thus, this study aims to measure the effect of stress in the aspect from practicing Thai hermit exercise among MCI patients.

Materials and Method

Design and Instruments: This study is a randomized controlled trial, 84 subjects will be elaborated at the multicenter. The target population of this study was participants who had been formally diagnosed with Mild Cognitive Impairment (MCI) and treated in King Chulalongkorn Hospital, Bangpli elderly club, Thai traditional medicine clinic at Ramkhamheang University. The participants were recruited following the eligibility criteria as follows.

Inclusion Criteria:

1. Patients who were diagnosed withMCI of age60 years and older.
2. Able to read speak and understand Thai with no severe hearing and blinding impairment.
3. Able to walk
4. Willingness to participate in the study and are able to provide the informed consent

Exclusion Criteria:

1. Regular practice of Thai hermit exercise (Ruesi dad ton)
2. Those that had been diagnosed with severe osteoporosis
3. Emergence of a new symptom
4. Does not have any previous cognitive impair by Medical illness
5. Does not have any sort of injury on the brain, skull, or scalp

Subject Allocation: The sample size for this study was calculated that a total sample size, based on a previous study[11], using power to detect 20% of effect size, with the power 80% and the alpha probability at 0.05. The G power computer application was applied to calculate the sample size. Participants were randomly assigned into one of the two parallel groups, either to an intervention group to receive the intervention or to a control group to receive usual care.The randomization list will be generated by using random number from the Excel program[12].Participants were provided with an information sheet as well as a consent form.

Ethical Consideration: In regards to the ethical principle, it has been approved by ethics committee of King Chulalongkorn Hospital.

Intervention: Thai hermit exercise (Ruesidat ton): This study was selected by some Thai traditional medicine experts for 3 postures from the original 80 postures that were involve with psychological status. For the intervention group about one hour a day and 3 times a week of Thai hermit exercise was arranged for 10 weeks. These exercises are indicated via Figures 1, 2 and 3.

Outcome Measurements: The Outcome will be assessed at the beginning of the exercise, week 6, and week 8 and again at week 10 in term of cognitive functions. Cognitive function used the standard test which are Verbal Fluency Test (Letters/categories), Trail making A-B Test and Digit Span. Each test has details as follows shown below

Psychological Indicators Questionnaire: This questionnaire will show how stress affects different parts of your life. Circle the response which best indicates how often you experience each stress indicator during a typical week, which apply to the international counseling team[13].

Figure 1: The posture to relieve face muscle, includes 7 postures numbered (a) - (g) and should be performed in sequential order

Figure 2: The posture to relieve laziness includes 7 postures numbered (a) - (g) and should be performed in sequential order

Figure 3: The posture to relieve headache, blur vision and general weakness includes 9 postures, numbered (a) – (i) and should be performed in sequential order.

Data Analyis: The demographic variables and the psychological status were analyzed using descriptive statistics such as: Chi-square test, frequencies, percentages, means, and standard deviations. The chi-squared tests were used to summarize the relationship of variables. Frequencies and percentages were used to summarize the categorical variables. Means and standard deviations were used to summarize the continuous variables.

Results

Demographics: From Table 1, the Chi-Square Tests results were not significantly correlated with the control and trial at 0.05 and it can be seen that the control group mainly consisted of female subjects which was about 36 people or up to 85.7% whereas there were only about 6 male subjects or about 14.3%. The age range of most participated subject were between 60-65 years old which consisted of 20 people or about 47.6%.The number of subjects between the age of 66- 70 years were about 18 people or about 42.9% and there were 4 people or about 9.5% in the age group of 70 years and older. The Marital status of most of the subjects were married which consisted of 36 people or about 85.8% while the subjects who were single consisted of 3 people or about 7.1%. Divorce, Widows/Separation subjects were also included in this research and there were also about 3 people or about 7.1% belonging to this category. The majority of the subjects which was about 29 people or 69.1% completed primary schools while about 8 subjects or only 19.0% completed their High school and there were few subjects about 5 people or 11.9% who completed their Bachelor degree. All of the 42 subjects (100%) worshipped Buddhist religion and are of Thai race.

The Intervention group mainly consists of 35 female subjects or about 83.3% and only about 7 male subjects or about 16.7%. More than half of the subjects were in the age group between 66-70 years old, which consisted of 23 people or about 54.8%.About 17 subjects or 40.5% of the subjects were in the age range between 60-65 years and there were only 2 subjects or 4.7% in the age range of 70 years and above. The Martial status of most of the subjects were married which consisted of 36 person or 85.7% and there were about 2 subjects or 4.8% whose status is single. Divorce, Widows/Separation subjects were also included in this research and there were also about 4 person or 9.5% of the subjects. More than half the subjects about 25 people or 59.5% completed their high school while about 10 subjects or 23.8% completed their Primary school. 7 subjects or 16.7% completed their bachelor degree. All of the 42 subjects (100%) worshipped Buddhist religion and are of Thai race.

Table 1: Comparisons of socio-demographic between the intervention group and the control group at pre-test

Characteristics	Control group		Experimental group		x^2	P value
	N	%	N	%		
Sex						
male	6	14.3	7	16.7	0.091	0.763
Female	36	85.7	35	83.3		
Age						
60 - 65 years	20	47.6	17	40.5	8.142	.087
66 – 70 years	18	42.9	23	54.8		
More than 70 years	4	9.5	2	4.7		
Status						
Single	3	7.1	2	4.8	2.657	.617
Marry	36	85.8	36	85.7		
Divorce/Widow/Separation	3	7.1	4	9.5		
Education						
Primary school	29	69.1	10	23.8	4.663	.324
High school	8	19.0	25	59.5		
Bachelors degree	5	11.9	7	16.7		

($p < 0.05$)

According to the result from the Table 2 (in the pre-test phase) it can be seen that there is no difference between control group and experimental group on psychological status (stress) at statistical difference of 0.05 ($p > 0.05$).

Table 2: Comparison between control group and experimental group on psycological statusin the pre-test

Variable	Control group		Experimental group		t	P value
	$\bar{x}$	S.D.	$\bar{x}$	S.D.		
Psychological Status						
Stress	3.76	0.32	3.63	0.34	1.81	0.074

($P< 0.05$)

According to the results from the Table 3 on Psychological Status, it can be seen that there were no differences in the control group at pre-test, after 6 weeks, after 8 weeks and after 10 weeks at statistical significance of 0.05 ($p > 0.05$). However, from Table 4, it can also be observed that a difference was found in the experimental group (for pre-test,6th week,8th week and 10th week) for the Psychological Status at a statistical significance of 0.05 ($p < 0.05$).

Table 3: Comparisons between the control group and experimental group on psychological status (stress) at pre-test, after 6 weeks, after 8 weeks and 10 weeks

Variable	Control Group		F	P value	Experimental Group		F	P value
	$\bar{x}$	S.D.			$\bar{x}$	S.D.		
Psychological Status								
Pre-test	3.76	0.32	0.659	0.543	3.63	0.34	306.233	0.00*
6 Weeks	3.66	0.52			2.38	0.37		
8 Weeks	3.75	0.51			2.25	0.39		
10 Weeks	3.67	0.33			1.84	0.15		

($P< 0.05$)

Table 4: Comparison of the differences observed in pre-test, 6 weeks, 8 weeks, and 10 weeks for Psychological Status in the experimental group

Variable	$\bar{x}$	pre-test	6 weeks	8 weeks	10 weeks
Psychological Status					
Pre-test	3.63	-	1.252 *	1.386 *	1.796 *
6 Weeks	2.38		-	.134 *	.544 *
8 Weeks	2.25			-	.410 *
10 Weeks	1.84				-

(P< 0.05)

Discussion

The present study determined to examine the condition of MCI patients by using a verbal influence test, a trail Maker B test and a Digit Span Test before and after the Thai Hermit exercise. Particularly, the aim was to examine the influence of psychological condition(stress) toward the advance of the Thai hermit exercise. In addition, this research aimed to compare the effect of Thai hermit exercise between the intervention and the control groups along the time period of observation. Two studies are in line with these findings, stating the fact that good physical performance seems to play a protective factor against cognitive decline whereby regular exercise promotes reduced risk of MCI and dementia[14, 15].Furthermore, the present study discovered that the observed psychological status at pre-test differed from that at the 6th, 8th and 10th weeks with a statistical significance ($p < 0.05$). Additionally, the results from the 6th week differed from the 8th and 10th week as well as the results from the 8th week differed from that of the 10th week at a statistical significance for the psychological status category ($p<0.05$). This is similar to results found in a study conducted by Lam *et al.*[16]whereby the authors reported a significant decrease in depressive symptoms after a 12-month group-based multi-modal exercise program compared with the pre-test level.

Conclusion

The psychological status showed that pre-test results differed from the 6th, 8th and 10th weeks at a statistical significance of 0.05 ($p < 0.05$) while the 6th week differed from the 8th and 10th weeks at statistical significance of 0.05 ($p< 0.05$). The 8th week was also seen to differ from the 10th week at a statistical significance of 0.05 ($p< 0.05$).

This study was successful in showing statistically significant results for the use of Thai hermit exercise as a tool for the improvement of psychological status in individuals with MCI. Future research should seek to identify population traits (such as age at which physical activity began, intervention duration, and baseline activity level) and intervention characteristics (such as type, frequency, duration, and intensity) that trend toward positive outcomes among these trials. Studies then could be designed appropriately to test the identified characteristics for research and knowledge purposes. In addition, long-term trials that enroll younger adults with interventions sustained for a longer periods would benefit the field and provide important insight on prevention. Although a physically active lifestyle often is proposed as a way to reduce stress and that cause of MCI and may be progress or leads to dementia. But some studies also indicate that there is not enough evidence to determine whether a single component like physical activity interventions actually offer or lead to the benefit of psychological effect. However, clinical practice largely encourages physical activity to prevent or dilute other chronic conditions, and this practice should continue, because it may offer benefits for improving psychological status as well.

Conflict of Interest: The authors declare that there are no conflicts of interest

Source of Funding: Self

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Relationship of Individual Characteristics and Noise Intensity with Subjective Hearing Loss to Workers at Pt. X

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Abstract

One company that has a risk of hearing loss is PT. X engaged in the supply, processing and distribution of steel and ready-mixed materials for construction, electricity, mining, telecommunication and transportation industries. Location of noise intensity there are 4 parts that is part of iron pole, elbow, pipe and work shop. The purpose of this study was to determine the relationship of individual characteristics and noise intensity with subjective hearing loss to workers in PT. X..The type of this research is analytic research with cross sectional design. Population in this study are all workers in unit production of PT. X as many as 157 people with a sample of 61 people. The sampling technique is simple random sampling. The study was conducted in January - October. The data were analyzed univariate using frequency and bivariate distribution using Chi-Square statistical test with significance level 95% $\alpha = 0,05$. The results showed less than half (49.2% of respondents subjected to subjective hearing loss. Less than half (39.3%) of respondents were at risk. More than half (68.9%) of respondents have long worked.

More than half (68.9%) had less intensity than NAB (<85 dB). More than half (60.7%) of respondents did not use ear protective equipment. There is a significant relationship of age, length of service, noise intensity, ear protection with subjective hearing loss in PT. X .It is expected that the company minimizes noise intensity by using silencers. The sound-proofing device can use the barrier wall between the machine and the worker or the silencer can be mounted on the sound source on the machine and it is expected that the company provides clear rules with sanctions for workers who do not use ear protection.

Keywords: *Age, Working Period, Noise Intensity, Use of PPE and Subjective Hearing Loss.*

Introduction

The ear is a very vulnerable organ that although it can accept the imposition of a certain range, finally ear will react and stop functioning, how the ear and some action should be taken in the workplace to protect workers' hearing ability [1].

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Data from the World Health Organization (WHO) in 2012 there were 250 million people worldwide with moderate or severe hearing loss, this figure rises to more than 275 million people. Based on the amount of 80% of them are in developing countries. In America, more than 5.1 million workers exposed to noise with an intensity of more than 85 dB[2].

A total of 246 workers in the United States for the purposes of hearing checked indemnity insurance, found 85% had nerve deafness and of that number 37% the frequency of 4000 Hz and 6000 Hz. Also according to NIOSH (National Institute for Occupational Safety and Health) note that 22 million workers have the potential for hearing impaired annually and 10 million workers in the United States have a hearing loss problem associated with the job[3].

The prevalence of hearing loss increased due to advances in the field of industrial technology and environmental noise. Indonesia including emerging industrial countries, so in an effort to increase the construction of used industrial equipment which can cause noise in the workplace. It is a damaging impact on workers if it is not prevented by the noise control programs include the use of hearing protection for workers exposed to noise[4].

In Indonesia, the problem of noise included in the major problems in the industrialized world. It is evident from the prevalence of hearing loss due to noise exposure in the workplace. Noise exposure received by workers with a prevalence ranging from 86.1 to 108.2 dB Noice Induced Hearing Loss (NIHL) amounted to 31.81% [5].

Occupational hearing disability (occupational deafness/noise-induced hearing loss) is the partial or complete loss of hearing someone permanent, on one or both ears caused by the continuous noise in the workplace environment. Hearing loss due to noise can be prevented by doing some preventive measures such as by the use of noise protection devices, limitation of exposure time and periodic audiometric examinations for early detection of disturbance. In connection with the effort to implement health and safety, the use of personal protective equipment is one attempt to control workplace noise. Act 1 of 1970 on Occupational Safety, in particular Articles 9, 12 and 14, which govern the provision and use of personal protective equipment at the workplace[6].

factors associated with hearing loss is noise, age, years of service, the use of personal protective equipment, history of smoking, use of ototoxic drugs, neighborhood, gender and medical history. The factors that most affect the value of hearing threshold is the age and length of exposure to noise. Someone workers have a longer service life may be at risk of occupational diseases than workers who have shorter working lives[7].

Age is a determining factor the increase someone listening threshold value. The level of compensation is used a correction factor of 0.5 dB per year for workers with more than 40 years of age. Age is a determining factor the increase someone listening threshold value. Some of the changes associated with the aging can occur in the ear. Membrane in the middle ear, including the ear drum becomes less flexible as we age[8].

Clinical symptoms of patients with hearing loss due to noise complaints worker after working for 5 years and it was only realized after the other party as a wife, children, and friends associate said that people need a voice loud enough to be able to hear. The increase in hearing threshold on the group work period> 5 years. Exposure to noise below 85 dB for a while does not cause a decrease in auditory function permanently[7].

Factors associated with hearing loss in the Production Department of Labor PT. Japfa Comfeed Indonesia in Makassar Unit found the results of the risk of age 23.9%, 45.7% work period risk, risk working long 45.7%, 58.7% do not wear APT, high noise intensity of 41.3% and complaints of hearing 60, 9% [10], Rahmawati research on factors associated with hearing loss in workers in the department of metal forming and heat treatment of PT. Dirgantara Indonesia (Persero) in 2015 found no association with the use of ear protectors non audiotory with subjective complaints (p value = 0.001)[5].

One company that has the risk of hearing loss is PT. X engaged in business in the supply, processing and distribution of steel and concrete material ready for konsruksi industry, electricity, mining, telecommunications and transportation. The company has a staff of about 485 people with as many as 157 production employees. Locations intensity of noise, there are 4 parts, iron pole, elbow, pipe and work shop.

A preliminary survey of researchers in July through interviews with 10 workers on each production PT. X said there were complaints of hearing in 6 (60%) say often experience dizziness, impaired communication and concentration at work less hard because the engine sound with the sound of pipe cutting machine, grinding machine iron, zinc plate waves and 4 (66.7%) with an average age of workers> 35 years. 5 people (83.3%) had hearing loss such as ringing in the ears due to work more than five years, 10 people have been interviewed four people no hearing loss because when working with ear protection equipment.

Method

This type of research is analytic with cross sectional approach, in which both the data collection for the independent variables (the noise intensity, age, years of service, the use of PPE) and the dependent variable (hearing loss subjectively) done together at the same time.[11]

This research was conducted at PT. X. When the

study in January-October. The population in this study were all workers at the production unit of PT. X as many as 157 people with a sample of 61 people. The sampling technique using proportional random sampling technique.

The statistical test used chi-square in data processing with SPSS is as beikut [12]:

a. When the table 2 x 2 found value E (expectation) <5 then the test value used is the fisher exact.

b. When the table 2 x 2 and not found the value of E (expectation) <5 then the test value used is the continuity correction.

Findings:

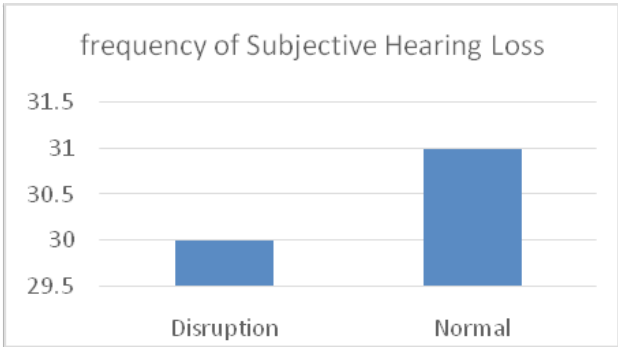

Figure. 1 Subjective Hearing Loss

The results of the study can be seen that less than half (49.2%) of respondents have a hearing loss subjectively. It can be seen from the results of the research answers as much as 57.4% despite having to leave the workplace steadily reduced hearing ability, 52.5% work while anxious, 47.5% often feel ear buzzing 44.3% others say workers face hearing loss, 42.6% worked in the company since the health of 41% easily distracted and easily tired while working.

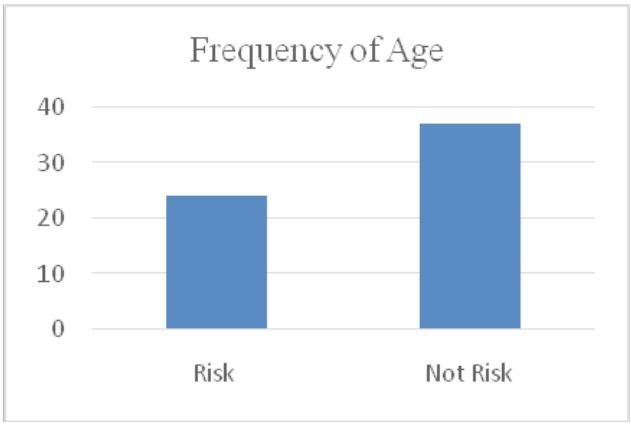

Figure 2. Age of Respondents

Based on Figure 2 above it can be seen that 39.3% have a lifespan of at risk at PT. X. The results are consistent with research done Ibrahim factors associated with complaints of hearing loss in manpower production PT. Japfa Comfeed Indonesia, Tbk. Makassar unit found the results of which 40.5% have a lifespan of at risk [9]

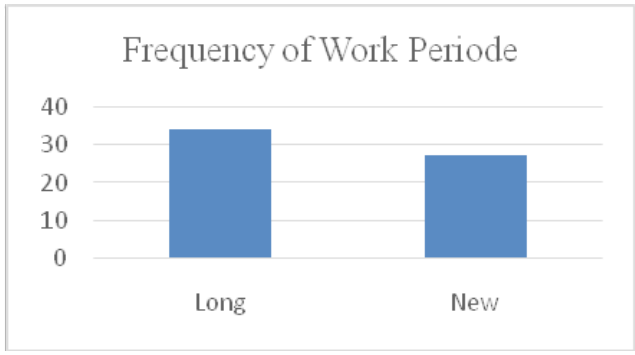

Figure 3. Work Period of Respondents

Based on the above Figure it can be seen that more than half (55.7%) of respondents have long worked. The results are consistent with research conducted Asriani Risk Factors Associated with Genesis Hearing on Mine Employees at PT Aneka Tambang (ANTAM) Southeast Sulawesi Pomalaa results found that 55.7% of workers have long worked[12].

Table 1: Age relationship with Subjective Hearing Loss

Age	Subjective Hearing Loss				Total		p value
	Disruption		Normal				
	f	%	f	%	f	%	
Risky	19	79.2	5	20.8	24	100	0,000
Not Bersiko	11	29.7	26	70.3	37	100	
Total	30	49.2	31	50.8	61	100	

Based on table 1 can be seen the proportion of workers who are experiencing hearing loss at the age of subjective higher risk (79.2%) compared to age without risk (29.7%). Based on test results obtained statistical p value = 0.000 (p <0.05) there is a significant correlation between age with hearing loss subjectively PT. X Padang.

Results of this research is similar to research done Ibrahim (2016) factors associated with complaints of hearing loss in manpower production PT. Japfa Comfeed Indonesia, Tbk. Makassar unit results found no correlation between age with symptoms of hearing loss

Table. 2: Relations with Hearing Loss Work Period Subjective

Years of Service	Subjective Hearing Loss				Total		p value
	Disruption		Normal				
	f	%	f	%	f	%	
Long	20	74.1	7	25.9	27	100	0,001
New	10	29.4	24	70.6	34	100	
Total	30	49.2	31	50.8	61	100	

According to the table 2can be seen that the proportion of workers with hearing loss subjectively higher on longer working lives (74.1%) compared with the new working period (29.4%). Based on test results obtained statistical p value = 0.001 (p <0.05) correlation meaningful working lives with hearing complaints of subjective PT. X Padang.

The results are consistent with research conducted Asriani Risk Factors Associated with Genesis Hearing on Mine Employees at PT Aneka Tambang (ANTAM) Pomalaa Southeast Sulawesi future results found no relationship working with the incidence of hearing loss[12].

Table. 3: The intensity of the relationship Subjective Noise with Hearing Loss

Intensity Noise	Subjective Hearing Loss				Total		p value
	Disruption		Normal				
	f	%	f	%	f	%	
More than NAB	25	59.5	17	40.5	17	100	0,034
Less than NAB	5	26.3	14	73.7	14	100	
Total	30	49.2	31	50.8	61	100	

According to the table 3 can be seen the proportion of workers who have a hearing loss subjectively higher the noise intensity over NAB (59.5%) compared with the intensity of the noise is less than the NAV (26.3%). Based on test results obtained statistical p value = 0.034 (p <0.05) there was a significant relationship with the noise intensity of subjective hearing loss in PT. X Padang.

Results of this research is similar to research Susanti, the fertilizer production plant, the results showed that there was correlation between intensity of noise with subjective complaints of hearing loss[14], The results are consistent with research at the hospital Ulandari Makasar results found no correlation of noise intensity with subjective complaints of hearing loss[15]

Conclusion

Based on research conducted by PT. X can be summarized as follows:

a. Less than half (49.2%) of respondents have a hearing loss subjectively PT. X .

b. Less than half (39.3%) of respondents have a lifespan of at risk at PT. X .

c. More than half (55.7%) of respondents have long worked in PT. X .

d. There was a significant association of age with hearing loss subjectively PT. X .

e. There is significant correlation tenure with hearing loss subjectively PT. X.

f. There is significant correlation with the noise intensity of subjective hearing loss in PT. X .

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Source of Funding: the source of the research cost from self.

Ethical Clearance: This study was approved by Bord Etis institutional Baiturrahmah University, Faculty of Public Health.

All subjects were fully informed about the procedures and objectives of this study each subject prior to the study signed an informed consent form.

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The Role of Matrix Metalloproteinase-9 (MMP-9) and Tissue Inhibitor Metalloproteinase-1 (TIMP-1) Level in Dengue Hemorrhagic Fever

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Abstract

Introduction: Vascular leakage is a hallmark of Dengue Hemorrhagic Fever (DHF), due to changes in interactions between cells and extracellular matrix in endothelial basement. It major components is type IV collagen that can be destaged by MMP-9. However, MMP-9 has an endogenous regulator, TIMP-1.This study aimed to evaluate between MMP-9 and TIMP-1 serum levels in children with DHF.

Method: A cross-sectional study, conducted in Wahidin Sudirohusodo Hospital Makassar, Indonesia. Population of children aged 1 to 18 years from September 2014 to March 2015.

Results: Out of 38 subjects, DHF stage I (34,2%), stage II (39,5%), stage III (26,3%) and no stage IV. No significant different levels of MMP-9 and DHF (P>0.05). There was difference levels of TIMP-1 in stage I and II (P<0,05). Level of MMP-9/TIMP-1 ratio is higher in stage I than II (P<0.05). Positive correlation between MMP-9 and TIMP-1 levels in stage II (P<0.05).

Conclusion: The levels of MMP-9 serum could not represent vascular condition in DHF. However, TIMP-1 serum, MMP-9/TIMP-1 ratio, and correlation between the levels of MMP-9 and TIMP-1 in DHF describe the vascular state instage I and II.

Keywords: *MMP-9, TIMP-1, Dengue Hemorrhagic Fever, Children.*

Introduction

As the endothelium forms the primary barrier of the circulatory system, dysfunction of the endothelial cells during acute diseases can broadly affect vascular permeability and cause plasma leakage.[1] Plasma leakage is a major marker of dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) associated with the secretion of inflammatory mediators in the circulation system, changes in adhesion cell interactions – extracellular matrix (ECM) and adhesion cell.[1,2,3] ECM - adhesion cells in endothelial basement membrane with the main components is type IV collagen, which is destaged by MMP-9, causing detachment from the basement membrane.[3,4]

Matrix Metalloproteinase-9 (gelatinase B) is a local proteolysis by degrading elastin (fibrous structural protein), collagen type IV and some other ECM molecules. MMP-9 which has been fully activated can be inhibited by natural inhibitors that TIMP-1. TIMP-1 binds non-covalently with the active MMP with a molar ratio of 1:1. The ability to inhibit MMP is shown by its ability to bind to the zinc-binding site in the catalytic domain of active MMP.[5] Vitro studies on immature dendritic cells are infected and uninfected dengue virus DV, an increase of about 5-fold for MMP-9 and 20-fold for TIMP-1,1.[6] however this has not been poven in humans yet.

The aim of this study was to evaluate the levels of MMP-9 and TIMP-1 in children with DHF. Hypothesis inthis study are MMP-9 levels were higher in DHF with higher stages, TIMP-1 levels were lower in DHF with higher stages and the ratio of MMP 9 and TIMP-1 were higher in DHF with higher stages.

Method

This is a cross sectional study to evaluate the MMP-9

and TIMP-1 levels in patients with DHF. The study conducted in pediatric ward of Child Health Department of Dr. Wahidin Sudirohusodo hospital, Makassar, Indonesia from September 2014 until March 2015.

The study population was patients with DHF without shock (stageI and II) and with shock (stage III and IV), aged 1 to 18 years.On the day of admission all patients diagnosed with DHF based onWHO criteria. The diagnosis was confirmed by IgM and IgG anti dengue serological examination. Patients who met the inclusion criteria were grouped into DHF stage I, II, III and IV according to the WHO 1997. The age, sex, weight, height, and nutritional status were measured. From each group, blood sample were taken to evaluate the MMP-9 and TIMP-1 levels. The inclusion criteria are the dengue patient, age from 1-18 years and want to be the sample of study and signed the informed consent. While the exclusion criteria are the dengue patient with another disease, blood transfusion, and corticosteroids. The study protocol was approved by Commission on Human Biomedical Research Ethics, Faculty of Medical, Hasanuddin University.

The obtained data were grouped based on the objective and types of data into DHF wihout shock (stage I and II) and DHF with shock (stage III and IV) to be analyze using appropriate statistic method; univariat, bivariat, and multivariate analyses.

Results

Table 1 shows sample characteristics in term of sex, age, nutritional status, DHF stage I, II, III, and IV, MMP-9 and TIMP-1 levels. In sex category it is shown that there are 23 (60.5%) male and 15 (39.5%) female. In age group it is found that the median is 6.75 year old, range 1-14 years old, with mean age of 6.87 years and standard deviation of 3.83 years. In nutritional status column, it is found that there is 1 patient who were overweight (2.6%),23 (60.5%) with a good nourished,13 (3.42%) with undernourished,and 1 (2.6%) with malnourished. In DHF stage I group there are 13 (34.2%) patients, 15 (39.5%)in stage II, 10 (26.3%) in stage III, and none in stage IV DHF group.

Kruskal Wallis test results showed no significant difference with p = 0.766 (p >0.05) between MMP-9 levels in group DHF stage I, stage II, and stage III (table 2). Allegedly it is associated with the function of MMP-9 as a local proteolysis and binding of MMP-9 to TIMP-1 in vascular that serum MMP-9 levels were not significantly different in DHF.

However, Kruskal Wallis test between TIMP-1 levels of DHF stage I, stage II and stage III shows a significant difference with p = 0.043 (p<0.05).*Post Hoc* analyses to determine which DHF group has difference by using a Mann Whitney test, it is found a significant difference of TIMP-1 levels in group DHF stage I and II,p value = 0.020 (p<0.05) (table 3). Presumably it has something to do with the binding between MMP-9 and TIMP-1; therefore, the levels of TIMP-1 were significantly only in DHF stage I and II.

Kruskal Wallis test between MMP-9/TIMP-1 ratioin DHF stage I, stage II, and stage III does not show a significant difference with p = 0.074 (p >0.05). Nevertheless, there is a significant difference with p = 0.018 (p<0.05) between MMP-9/TIMP-1 ratio in DHF stage I and II (table 4).This is influenced by the levels of MMP-9 and TIMP-1 serum so the meaningful significant is only between DHF stage I and II.

Linear regression analyses between MMP-9 and TIMP-1 in table 5 shows a positive correlation of 0.220 in DHF stage 1 and 0.531 in DHF stage 2, negative correlation of-0.139 in DHF stages 3. There is no significant correlation inDHF stage 1 and 3 with p 0.470 and 0.701 (p >0.05). There is a significant correlation between MMP-9 and TIMP-1 in DHF stage 2 with p 0.042 (p <0.05) (table 5). Allegedly this is due to the stage of complex 3 is formed MMP-9: TIMP-1 were significantly.

Table 1: Characteristics sample

No.	Characteristics Sample	Total (n=38)
1	Sex	
	Male : Female (%)	23 : 15 (60.5 : 39.5)
2	Age (Year)	
	Median (Range)	6.75 (1 – 14)
	Mean (SB)	6.87 (3.83)
3	Nutritional status	
	Overweight: Good nourished Undernourished: malnourished (%)	1 : 23 : 13 : 1 (2.6 : 60.5 : 34.2 : 2.6)
	Dengue Hemorrhagic Fever	
4	Without Shock : Shock (%)	
	Stage I (%)	28 : 10 (73.7 : 26.3)
	Stage II (%)	13 (34.2)
	Stage III (%)	15 (39.5)
	Stage IV (%)	10 (26.3)

No.	Characteristics Sample	Total (n=38)
	MMP-9 (ng/ml) level	0 (0)
5	Median (Range)	
	Mean (SB)	1.77 (0.20 – 31.01)
	TIMP-1 (ng/ml) level	4.74 (7.93)
6	Median (Range)	2.38 (0.18 – 10.97)
	Mean (SB)	2.95 (2.27)

Kruskal Wallis test results showed no significant difference with p = 0.766 (p >0.05)

Table 2. Analyses of comparison between MMP-9 level of DHF stage I, stage II and stage III

MMP-9 Levels (ng/ml)	DHF		
	Without Shock (n=28)		Shock/ Stage III (n=10)
	Stage I (n=13)	Stage II (n=15)	
Median	1.84	1.10	1.81
Standard deviation	7.12	7.76	9.63
Range	0.27 – 27.06	0.20 – 29.08	0.36 -31.01
Kruskal-Wallis test		df = 2	(p > 0.05)

Table 3. Analyses comparison between TIMP-1 level in DHF stage I, stage II and stage III

TIMP-1 levels (ng/ml)	DHF		
	Without shock (n=28)		Shock/Stage III (n=10)
	Stage I (n=13)	Stage II (n=15)	
Median	1.77	3.01	2.78
Standard deviation	1.15	2.53	2.09
Range	0.17 – 5.15	0.88 – 10.97	1.13 – 8.22
Kruskal Wallis test		df = 2	(p <0.05)

Table 4: Analyses Comparison between MMP-9/ TIMP-1 ratio in DHF stage I, stage II and stage III

MMP-9/TIMP-1 Ratio	DHF		
	Without shock (n=28)		Shock/ Stage III (n=10)
	Stage I (n=13)	Stage II (n=15)	
Median	2.18	0.59	0.37
Standard deviation	5.49	1.65	4.81
Range	0.11 – 17.83	0.09 – 6.53	0.18 -14.85
Kruskal Wallis test		df = 2	(p >0.05)

Table 5: Linear regression analyses between MP-9 and TIMP-1 in DHF

Variable	DHF Stage 1 (n=11)		DHF Stage 2 (n=13)		DHF Stage 3 (n=10)	
	Correlation	p value	Correlation	p value	Correlation	p value
MMP-9 and TIMP-1	0.220	0.470	0.531	0.042	-0.139	0.701

Spearman's rho correlations

Discussion

The results of this study, there were no significant difference between the levels of MMP-9 and DHF, but there is a difference between the levels of TIMP-1 DHF stage I, stage II and stage III with significant differences in stage I and II. There is a significant difference between the ratio of the levels of MMP-9/TIMP-1 DHF stage I and stage II, and there is a significant positive correlation between levels of MMP-9 and TIMP-1 in DHF stage II. Retrieved 38 samples were grouped into 4 groups, DHF stage I have 13 samples (34.2%), stages II have 15 samples (39.5%), stage III have 10 samples (26.3%) and none in stage IV. Analyses was performed on the levels of MMP-9 and TIMP-1. Study on MMP-9 and virus dengue (VD) is still rare. Some of these studies are studied in vitro and vivo, while the relationship between TIMP-1 and VD so far are obtained only a study in vitro.[7,8,9]

In vitro study by Luplerdlop et al.he obtained a significant difference between the levels of MMP-9 imature dendritic cells are infected and uninfected VD and research by Luplerdlop and Misse obtained a non-significant difference between the levels of MMP-9 MVEC (macrovascular endothelial cells) of infected and uninfected VD.[7,8] It means that VD activate the dendritic cells or monocytes to produce MMP-9 and did not activate endothelial cells to produce MMP-9. This study was supported by the research of Seanpong et al.which he found that the levels of MMP-9 increased in monocytes (U937) and not in hepatocytes (HepG2) infected with VD.[9]

In this study found a mean value of the MMP-9 DHF levels corresponding increase in rank, but there was no significant difference with p = 0.766. This is according to the research by Voraphani et al. which obtained a non-significant difference between dengue and DD. This is related to the function of MMP-9 as a local proteolys is and binding of MMP-9 by TIMP-1 in vascular; therefore,the levels of MMP-9 serum did not differ significantly on dengue and the study did not measure the levels of MMP-9 complex: TIMP-1 that measures MMP-9 after it tied with TIMP-1.[4] In vitro study obtained significant difference between the levels of TIMP-1 imature dendritic cells infected and uninfected VD, while the other ones obtained a significant difference between the levels of TIMP-1 MVEC (macrovascular endothelial cells) of infected and uninfected VD. This means VD activates the monocytes and derivatives to produce MMP-9, the monocyte and endothelial derivatives to produce TIMP-1. This study was supported by the research of Seanpong et al.[9]which found that there were expressions of TIMP-1 in monocytes (U937) and not in hepatocytes (HepG2) were infected with VD. TIMP-1 is activated by endothelial due to stress on the blood vessels due to changes in the interaction between endothelial-MES and endothelial caused by MMP-9.

Studies in vivo TIMP-1 and dengue have not been obtained by the author. Kruskal Wallis test results between the levels of TIMP-1 DHF stage I, stage II, stage III and obtain the result of significant differences with p values of 0.043 ($p < 0.05$). After a post hoc analyses to determine the DHF group that have different, with Mann Whitney test obtained significant differences in the levels of TIMP-1 DHF stage I and II, the value of p = 0.020 ($P < 0.05$).TIMP-1 Activated by monocytes and derivatives as well as endothelial response to vascular leakage caused by MMP-9. Allegedly levels of TIMP-1 gives an overview of the initial damage vascular function due to vascular leakage caused by MMP-9 destages collagen type IV result, whereas type IV collagen is a major component of basement membranes endotel.[3]

Study for MMP-9/TIMP- 1 ratio and DHF has not been found in the journals, but the research ratio of MMP-9/TIMP-1 in community acquired pneumonia showed higher than control.[10] In this study, there were no significant differences between the ratio of MMP-9/TIMP-1 DHFstage I, stage II and stage III, but there is significant difference between the ratio of MMP-9/TIMP-1 DHF stage I and stage II with ratio of the levels of MMP-9/TIMP-1 were higher in stage I compared the stage II. This is not in accordance with the initial hypothesis. MMP-9 as a function of local proteolysis, thereby MMP-9 are found abundantly in the vascular tissue and not so that play a role in DHF stage I and II are TIMP-1, which is visible from the ratio of the levels of MMP-9/TIMP-1. But for DHF stage III, the levels of MMP-9 ratio/TIMP-1 and TIMP-1 is no longer meaningful, presumably this is due to the binding of TIMP-1 to MMP-9 which can be measured with a complex MMP-9: TIMP-1 examination. This is supported by the results of the linear regression correlation is performed as TIMP-1 is a specific endogenous inhibitor of MMP-9. [5] There is a positive correlation between levels of MMP-9 and TIMP-1 in DHF stage I and stage II, this means that the levels of MMP-9 in line with the levels of TIMP-1. However, the only significant correlation when there is spontanously bleeding (DHF stage II).

However, this study has absence of data and dengue fever on how day longof patient in stage IV, the number of small sample, and not an examination of the serotypes VD because of differences would affect the levels of MMP-9 and TIMP-1, and the absence of MMP-9 complex measurements: TIMP-1. The strengths of this study is dengue is a disease that causes changes in the interaction or adhesion between endothelial vascular and between endothelial-MES that cause vascular leakage. Vascular leakage rate is directly proportional to the severity of DHF. This study describes the various pathomechanism MMP-9 and TIMP-1 in DHF, the in vivo studies that provide new insights into the levels of TIMP-1, the ratio of MMP-9/TIMP-1, and the correlation between MMP-9 and TIMP-1 in various DHFstages. Thus providing new insights into the MMP-9, TIMP-1, and vascular function.

We concluded that there is no relationship between serum MMP-9 levels and severity of dengue. But there is a relationship between serum levels of TIMP-1 and the ratio of MMP-9/TIMP-1 against DHF stage I and II, as well as a significant and positive correlation between levels of MMP-9 and TIMP-1 in DHF stage II. This means that the levels of MMP-9 serum could not represent vascular condition in DHF. However, serum levels of TIMP-1 and MMP-9/TIMP-1 ratio describe the vascular state in DHF stage I and II.

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Ethanol Extract with Black Cumin (Nigella Sativa) Against sFlt-1 Level and VEGF Serum on Laboratory Mice with Preeclampsia

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Abstract

Introduction: Preeclampsia is one of the complications that occur in pregnancies. This study was aimed to study the factors that affect the of giving ethanol extract with black cumin (*Nigella sativa)* against sFlt-1 level and VEGF serum on laboratory mice induced preeclampsia.

Method: Laboratory experimental research with post test only control group design. This study used 30 BALB/C laboratory mice, divided into 6 groups, namely negative controls: pregnant mice injected serum from normal pregnant women, positive controls; mice modeled preeclampsia, and treatment groups 1, 2, 3 and 4 are preeclampsia mice received a dose of 500 mg, 1000 mg, 1500 mg and 2000 mg/kg weight of Nigella sativa ethanol extract for 5 days. Statistical analysis using ANOVA

Result: The mean serum sFlt-1 level in mice modeled preeclampsia and treatment group dose 500mg, 1000mg, 1500mg and 2000mg (2510.3+182.2 pg/mL, 2142.5+171.9 pg/mL, 1309+161.3 p/mL, and 1500+169.9, respectively) pg/mL) showed a significant difference ($p<0.05$) and found a decrease in serum sFlt-1 levels with increasing doses. The mean serum VEGF levels in preeclampsia mice and treatment groups were 500 mg, 1000 mg, 1500 mg and 2000 mg (50.25±2.85b pg/mL, 60.18±4.81c pg/mL respectively, 71.89±2.38d pg/mL, 66.51±1.87 e pg/mL) showed a significant difference ($p<0.05$) and found an increase in serum VEGF levels as the dose increased.

Conclusion: Giving of Black Cumin extract (Nigella sativa) decreases serum sFlt-1 levels and increases serum VEGF levels in preeclampsia mice model and the effect is dependent dose.

Keywords: *sFlt-1, VEGF, Nigella sativa, preeclampsia.*

Introduction

Preeclampsia is one of the complications that occur in pregnancies of more than 20 weeks which is characterized by an increase in systolic blood pressure greater or equal to 140 mmHg or diastolic pressure greater than or equal to 90 mmHg and the amount of proteinuria 300 mg or more than 30 mg/dL per 24 hours[1]. Preeclampsia occurs in about 3-5% of pregnant women worldwide and the number two cause of death for pregnant women. In the United States, 15% of maternal deaths are caused by preeclampsia [2,3].

The pathogenesis of preeclampsia occurs with a variety of mechanisms, but placental ischemia/hypoxia is likely to be a major factor due to disruption of trophoblast invasion[4]. Placental ischemia will stimulate excessive production of sFlt-1 or VEGFR-1. The presence of sFlt-1 as a competitor for surface VEGF receptors (Flt-1), causes VEGF cannot attach to receptors on the cell surface. This situation causes serum VEGF levels

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to decrease and induce endothelial cell damage in the glomerulus, producing a urine protein[5,6].

Black cumin has been used as a traditional medicine for thousands of years for various diseases such as asthma, coughing, bronchitis, headaches, fever, and rheumatism[7]. Seed extracts of both water and oil have the potential to be anti-tumor, antioxidant, anti-inflammatory, anti-hypertensive, anti-diabetic and anti-seizure. Thymoquinone (TQ) is the main constituent of Black Cumin essential oil[8,9]. As an antioxidant, thymoquinone synergizes with other compounds such as dithymoquinone and thymol as a free radical scavenger[10]. As TQ Anti-inflammatory inhibits activation of NFκβ. In cases of preeclampsia where placental hypoxia occurs, activation of NFκβ will affect the expression of hypoxia-inducible factor 1-α (HIF1-α)[11] which is a VEGF[12] transactivator.

By referring to the above facts because Black Cumin (Nigella Sativa) has the potential as an antioxidant and anti-inflammatory, it is necessary to conduct research on the molecular mechanism of Black Cumin extract (BC-e) on serum sFlt-1 and VEGF levels in preeclampsia mice.

Design and Method

This research is a laboratory experimental study with a post test only control group design. This study measured serum sFlt-1 and VEGF levels in the mice model of preeclampsia after being given several doses of Nigella sativa extract. A total of 30 pregnant BALB/C mice were used in this study, divided into 6 groups: pregnant mice injected with serum of normal pregnant women were used as negative controls, preeclampsia mice were as positive controls, and 4 groups of preeclampsia mice were treated with BC-e with a dose of 500 mg, 1000 mg, 1500 mg and 2000 mg/kg of body-weight/day for 5 days. Mice model preeclampsia made by injecting serum of preeclamptic pregnant women on the 10th and 11th days of gestation each 0.1cc intraperitoneally[13.14]. The manifestation of preeclampsia in mice is obtained by finding hypertension and proteinuria on the 15th day of gestation. Maintenance of mice and modeling of preeclampsia were carried out at the Pharmacology Laboratory of the Faculty of Medicine, University of Brawijaya and got standard food and drink.

Mice are terminated at 20 weeks' gestation and blood and kidney organs are collected. Examination of sFlt-1 and VEGF levels in mice serum was measured using an ELISA kit, pg/Ml unit.

Result

The comparison test results showed a difference (p = 0.000 <) the mean serum sFlt-1 level between the negative control group (healthy mice) (579.8 ± 114.8 pg/mL) and the positive control group (preeclampsia mice) (2752.8 ± 188.7 pg/mL)) Likewise there was a significant difference (p = 0.000 <) mean serum VEGF levels between healthy groups (88.56 ± 5.58 pg/mL) with preeclampsia mice model (44.85 ± 2.15 pg/mL). As shown in table 1.

Table 1: Results of Comparison of Control Groups

Variable	Negative Control (Healthy) Mean ± SD	Positive Control (Eclampsia) Mean ± SD	p-value
sFlt-1 serum level (pg/mL)	579.8±114.8	2752.8±188.7	0.000
VEGF serum level (pg/mL)	88.56±5.58	44.85±2.15	0.000

Based on the results of the one way ANOVA test on serum sFlt-1 level data, there were significant differences in the mean serum sFlt-1 level in the five observation sample groups (p-value<0,000). Furthermore, the Multiple Comparisons with the Least Significant Difference (LSD) showed that there was a difference between the mean serum sFlt-1 levels between the positive control group (model preeclampsia mice) (2752.8±188.7apg/mL) and the treatment group gave ethanol extract Nigella sativa doses 500mg (2510.3±182.2b pg/mL), with a dose of 1000mg (2142.5±171.9cpg/mL), with a dose of 1500mg (1309±161.3dpg/mL), and also with a dose of 2000mg (1500±169.9dpg/mL). This means that there is a treatment effect of giving 500mg, 1000mg, 1500mg and ethanol Nigella sativa extracts to serum sFlt-1 levels in preeclampsia mice.

Table 2: The influence of Nigella sativa ethanol extract on mean serum sFlt-1 levels and VEGF levels

Intervention Group	Mean Serum sFlt-1 levels (pg/mL)	Mean Serum VEGF (pg/mL)
Negative control	579,8	88,56
Positive control	2752,8	44,85
Preeclampsia Mice + Ethanol Extract 500 mg	2510,3	50,25
Preeclampsia Mice + Ethanol Extract 1000 mg	2142,5	60,18
Preeclampsia Mice + Ethanol Extract 1500 mg	1309,0	71,89
Preeclampsia Mice + Ethanol Extract 2000 mg	1500,0	66,51

Based on the results of the One Way ANOVA test on VEGF level data, there were significant differences in the mean VEGF levels of the five observation sample groups (p-value=0,000). Furthermore, the Multiple Comparisons with the Least Significant Difference (LSD) showed that there were significant differences in the mean VEGF levels between the positive control group (preeclampsia mice) (44.85±2.15 pg/mL) and the treatment group administered ethanol extract Nigella sativa at a dose of 500mg, 1000mg, 1500mg and 2000mg (50.25±2.85b pg/mL, 60.18±4.81c pg/mL, 71.89±2.38d pg/mL and 66.51±1.87e pg/mL). There appears to be an increase in serum VEGF levels along with an increase in the dose of ethanol extract except at doses of 2000 mg. If based on the average value of VEGF levels, the treatment group doses 1500mg show the highest value of the average VEGF level (71.89±2.38d pg/mL) compared to the group in other doses and can be considered the fastest dose in increasing VEGF levels in mice models preeclampsia.

The occurrence of a decrease in serum sFlt-1 levels and an increase in VEGF in line levels in increasing doses. The 1500mg dose seems to be the optimal dose of reducing serum sFlt-1 levels and increasing serum VEGF levels.

Discussion

This study showed that sFlt-1 serum levels in pregnant mice injected with pre-eclampsia maternal serum (2752.8±188.7 pg/mL) significantly increased compared with negative control mice. The administration of pre-eclampsia serum intraperitoneal injection with high TNF levels in pregnant mice increase blood pressure and serum sFlt-1 levels[14] which caused by an increase in angiotensin II[15].

The previous study reported that the administration of IgG injection of preeclampsia mothers increase TNF serum levels in pregnant mice. Increased levels of sFlt-1 in preeclampsia patients can reduce levels of free VEGF and PlGF in the circulation resulting in the onset of symptoms of preeclampsia[16,17]. Soluble Fms-like tyrosine kinase-1 (sFlt-1), also known as Soluble vascular endothelial growth factor receptor 1 (sVEGFR-1) which is a soluble receptor for VEGF and PlGF[18] which acts as VEGF and PlGF against by binding and inhibiting interactions both of them against endogenous receptors[19].

This study showed the serum VEGF levels of preeclampsia mice have a significant decrease compared to control mice. The injection of serum for pregnant women PEB in pregnant mice causes pre-eclampsia-like symptoms because TNF-α found in maternal serum binds to TNF type 1 receptors (TNFR-1) mice which in turn activate the NF-κB[20] transcription factor. NF-κβ activation by TNF α may play a role in inducing HIF-1α[21] which is a transcription factor for sFLT formation in the placenta[22]. sFlt does not have a transmembrane domain and membrane[6] cytoplasmic domain, so the bond between VEGF and PlGF to sFlt-1 cannot provide a second messenger for angiogenic and has an antiangiogenic effect[5]. The presence of sFlt-1 as a competitor for surface VEGF receptors (Flt-1) causes VEGF cannot attach to receptors on the cell surface. This condition causes serum proangiogenic VEGF levels to drop by 5/6. Decreasing levels of free VEGF can also indirectly increase in blood. The low levels of free VEGF in serum could decrease in nitric oxide (NO) which cause in blood vessel vasoconstriction followed by an increase in blood pressure.

There was a significant difference in serum sFlt-1 levels in preeclampsia mice with a treatment group given a dose of BC-e dose of 500 mg, 1000 mg, 1500 mg, and 2000 mg. Antioxidant supplements to preeclampsia patients able to reduce serum sFlt-1 levels

and increase serum PlGF levels. Black cumin with the main content of Thymoquinone (TQ) has the potential as an antioxidant so that it can reduce serum sFlt-1 levels in preeclampsia mice significantly[23]. TQ is able to inhibit organ damage caused by free radicals[10]. The antioxidant effects of TQ, dithymoquinone, and thymol be able to inhibit some reactive oxygen species (ROS). TQ and dihydrothymoquinone (DHTQ) have the ability as free radical scavengers with a half inhibitory concentration (IC50) in nanomolar concentrations and micromolar[10]. All ingredients of black cumin have a strong antioxidant effect, where thymol works by quelling single oxygen production, while TQ and dithymoquinone show activities such as superoxide dismutase (SOD)[24].

There was a significant difference in the mean serum VEGF levels of preeclampsia mice with a treatment group that was given a dose of 500 mg, 1,000 mg, 1500 mg, and 2000 mg of BC-e. The effect of BC-e on increasing serum VEGF levels in preeclampsia mice is not fully understood. TQ has the ability to inhibit transcription factors, nuclear factor kappa β (NFκβ) is thought to be the cause. TQ as an inflammatory inhibitor works through anti-inflammatory and proapoptotic action[25].

TQ can inhibit the bonding of NFκβ to DNA through direct interaction with sub-unit p65. TQ will inhibit activation by IkBα kinase which in turn will inhibit degradation and phosphorylation of IκBα thereby inhibiting the activation and translocation of NFκβ from the cytoplasm to the cell nucleus[26]. Barriers to activation of NF-kβ cause decreased HIF1-α expression. In preeclampsia placenta, the inhibition of activation of HIF1-α can reduce the synthesis of sFlt anti-angiogenic factors, and ultimately increase the VEGF angiogenic factor that enters the maternal circulation.

The role of BC-e as an antioxidant is also thought to play a role in increasing VEGF levels. Antioxidant supplementation caused a significant decrease in the concentration of sFlt-1 and increased PlGF in plasma. Whereas in vitro studies showed beneficial effects of antioxidants on VEGF. BC-e has considerable antioxidant properties both in vivo and in vitro[8,24]. In its activity as an antioxidant, thymoquinone synergizes with other compounds such as dithymoquinone and thymol to capture free radicals[10].

The average increase in serum VEGF levels along with the increase in the dose of black cumin extract given and the optimal dose of NS in increasing VEGF levels in serum is 1500 mg. At a dose of 2000 mg, there is a decrease in serum VEGF levels. This is presumably because the effect of hormesis is found in the effects of the response dose[27], where at low doses black cumin ethanol extract has a beneficial effect while at high doses it has a detrimental effect.

Conclusion

Giving of Black Cumin extract (Nigella sativa) decreases serum sFlt-1 levels and increases serum VEGF levels in preeclampsia mice model and the effect is dependent dose.

Ethical Clearance: Ethical approval was obtained from the ethics committee of Brawijaya University.

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Effect of Nutritional Status, Hemoglobin Levels and Psychosocial Emotional Behavior with Cognitive Function of Female Teenager

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Abstract

Teenager are the future generation, with the cognitive abilities of a good expected level of education will be good. The impact of nutritional status abnormal, low hemoglobin levels, and disorders psychosocial emotional behavior associated with cognitive abilities in teenager, especially in female teenager. The objective of this study is to analyze the effect between nutritional status, hemoglobin levels, and psychosocial emotional behavior with cognitive function in female teenager. This research used observational analytic method with cross sectional approach. Data were collected during February-March 2019. Respondents in this study were students or female teenager in accordance with the inclusion and exclusion criteria. Sampling technique in this research is probability sampling type simple random sampling with a total sample of 72 female teenager respondents. The independent variables studied are nutritional status, hemoglobin levels, and psychosocial emotional behavior and dependent variable was cognitive function in female teenager. Data nutrition status collected by BMI measurements according to age, hemoglobin levels by hemocue tool, psychosocial emotional behavior was measured by PSC-35 and cognitive function was measured by MMSE-test. Analysis was using logistic regression. The results of research obtained that there is effect between the nutritional status of skinny, low hemoglobin levels (anemia) and suspect there are disorders psychosocial emotional behavior with a value of $p < 0.05$. Risk factors nutritional status of skinny, low hemoglobin levels (anemia) and suspect disorders psychosocial emotional behavior on cognitive function below normal, amounted to 81,4% and 18.6% was caused by other factors. Nutritional status, hemoglobin levels, and behavior psychosocial emotions affect the cognitive function of female teenager.

Keywords: *Nutritional status, hemoglobin levels, psychosocial emotional behavior, cognitive function, female teenager.*

Introduction

Teenager is a time of transition from children to adult. A period when a lot of things in life changed with a very high speed and this period is a preparation for adulthood that will pass through several stages of development is important.(1)Some research mention, teenagers at risk of impaired development of cognitive function caused by several factors such as factors of physical and mental health, family, environment and peers.(2)

Data from the Ministry of education and culture occurs to a significant decrease in the average yield of the ability of cognitive function of learners of Indonesian in the school. The upper level, the obtained average results of cognitive function in students of Vocational High School as a whole in 2015 is 62,11 and 2016 have average 57,66.(3)Nutritional problems in teenager will have an impact on the decline of brain function, decrease in body to do physical activity, and loss of physical fitness will affect the health of a teenager.(4)

The prevalence of the risk of lack of energy chronic in women of childbearing of age group 15-19 years in Indonesia in 2007 amounted to 30,9% increased to 36,3% in 2018. Overall, the prevalence of the risk of less energy chronicle women of childbearing of age group 15-19 years is high when compared with other age groups. Based on Basic Health Research 2018 the prevalence of obesity in teenager (≥15 years) in

Indonesia increased from 26,6% in 2013 to 31.0% in the year 2018. In addition to the prevalence of the risk of lack of energy chronic and obesity in teenager, the prevalence of anemia in female teenager has increased from 37,1% in 2013 to 48.9% in the year 2018.(5)

In addition to the nutritional problems in teenager, there is a relationship between the psychosocial conditions of a person with a cognitive ability. The stability of the psychosocial is very important in the development of cognitive abilities, the inability of a person to control the depression and emotions will lead to instability of the psychosocial so that individuals will experience difficulties in learning. Learning difficulties are due to instability of the psychosocial is one of the causes of low academic potential.(6) According to the data of Basic Health Research, the prevalence of mental emotional disorder in the population aged ≥15 years increased from 6% in 2013 to 9.8% in the year 2018.(5)

Based on preliminary studies conducted in 22 female teenager in SMK Negeri 1 Grogol, showed female teenager with the status of malnutrition, anemia, and disorders psychosocial emotional behavior, 22% to obtain the value of the cognitive function that is not normal. Teenager are the future generation, with the cognitive abilities of a good expected level of education will be good.

The impact of nutritional status, hemoglobin levels, and psychosocial emotional behavior associated with cognitive abilities in adolescents, especially in female teenager. These things clearly corroborate that the health of the teen determine the effort in quality of the next generation in the future. This research was conducted because the author wanted to examine the influence of nutritional status, hemoglobin levels, and psychosocial emotional behavior with cognitive function of female teenager in SMK Negeri 1 Grogol Kediri.

Materials and Method

The study was conducted with cross sectional method. Sample of this study is female teenager in SMK Negeri 1 Grogol Kediri during February-March 2019 that meet the inclusion and exclusion criteria. The criteria for inclusion of respondents in this research is female teenager, are already experiencing a menstrual and sign a letter of informed consent to be a respondent. Exclusion criteria from this study are the respondents who are menstruating and respondents who have health problems such as diarrhea and menorrhagia.

The method of sampling is with simple random sampling technique. This study the independent variables are nutritional status, hemoglobin levels, and psychosocial emotional behavior, the dependent variable is cognitive function. Datanutrition status collected by BMI measurements according to age, hemoglobin levels by hemocue tool, psychosocial emotional behavior was measured by PSC-35 and cognitive function was measured by MMSE-test.

Statistical analysis using a computer program namely SPSS version 21. The analysis of the analytic wear test statistics non parametriclogistic regression to determine whether there is influence between nutritional status, hemoglobin levels, and psychosocial emotional behavior with the cognitive function of female teenager. This analysis is used for dependent variables with a measurement scale of categorical variable. In logistic regression the quality of the formula is obtained from the ability of discrimination and calibration. Calibration by the method of Hosmer and Lameshow. In addition, the value of Nagelkerke R Square is also seen to see how much the proportions of independent variables can predict the occurrence of the dependent variable.

This research has received approved from the Health Research Ethics Committee from the Public Health Faculty of Airlangga University Surabaya by letter No.76/EA/KEPK/2019.

Finding: The number of samples obtained by simple random sampling technique as many as 72 female teenager respondents.

Table 1: Distribution of nutritional status, hemoglobin levels, psychosocial emotional behavior and cognitive functions of female teenager.

Variable	Total (n = 72)	
	Frequency	Percentage (%)
Nutritional Status		
Underweight	22	30,6
Normal	27	37,5
Overweight	23	31,9
Hemoglobin Levels		
Anemia	19	26,4
Normal	53	73,6
Psychosocial Emotional Behavior		
Suspect Disorder	19	26,4
Normal	53	73,6
Cognitive Function		
Under normal	20	27,8
Normal	52	72,2

Table 2: Effect of nutritional status, hemoglobin levels, psychosocial emotional behavior with cognitive function of female teenager

Variable	β	Exp (β)	p	Description
Nutritional Status			0,137	Not Significant
Underweight	-3,547	0,029	0,048	Significant
Normal	-1,253	0,286	0,366	Not Significant
Overweight	Reference Group			
Hemoglobin Levels				
Anemia	-6,133	0,002	0,001	Significant
Normal	Reference Group			
Psychosocial Emotional Behavior				
Suspect Disorder	-3,808	0,022	0,007	Significant
Normal	Reference Group			
Constant	6,276	531,524	0,001	Significant
Nagelkerke R square = 0,814				

Test results analysis using logistic regression showed there is the influence of the nutritional status of skinny, low hemoglobin levels (anemia) and suspect disorders psychosocial emotional behavior with a value of $p < 0.05$. The influence of risk factors nutritional status of underweight, low hemoglobin levels (anemia) and suspect disorders psychosocial emotional behavior on cognitive function below normal, amounted to 81,4% and 18.6% was caused by other factors.

Discussion

Teenagers actively construct their cognitive world, where the information obtained is not directly accepted so just into their cognitive schema. Teenagers have been able to distinguish between ideas that are more important than other ideas, and adolescents also develop this idea. A teenager does not just organize experienced and observed, but also able to process their way of thinking thus giving rise to a new idea.[7]

The effect of nutritional status on cognitive function: The results of the statistical test of the effect of nutritional status on cognitive function showed that nutritional status has no effect on cognitive function. The results obtained p-value = 0,137 ($p > 0.05$) showed that the nutritional status is not a factor that affects the cognitive function of respondents is below normal, but on the nutritional status of underweight $p = 0.048$ ($p < 0.05$) showed that the nutritional status of the underweight is a factor that affects cognitive function below normal. The value of Exp(β) = 0,029 mean that the respondents nutritional status underweight then it is likely to have the ability of cognitive function below normal 0,029 times compared to respondents with normal nutrition status.

Teenagers have nutritional needs that are unique when viewed from the point of view of biology, psychology, and from a social point of view. As if viewed from the point of view of the social and the psychological, the adolescents themselves believe that they do not pay too much attention to health factors in the dropping of food choices, but rather paid more attention to other factors such as the adults around them, the hedonistic culture, the social environment, and other factors that strongly affect it.[8]

The results of the other studies mentioned teenagers with malnutrition give poor results on test of attention, working memory, learning and memory as well as the ability visuospatial except on the test of motor speed and coordination.[9] The nutritional Status of low or excess will lead to a difficult teenager to live in a healthy, active and productive. State of malnutrition can hinder the intelligence of the teenage brain because of the cognitive abilities of a person affected by the nutrients consumed. [10]

When it reaches peak growth velocity, teenagers usually eat more often in large quantities. After the growth spurt, they usually will be paid more attention to her appearance, especially female teenager. They are often times too strict in your diet in maintaining her appearance, so it could cause nutritional deficiencies. Increased activity, social life, and the busy teen will affect their eating habits. Food consumption patterns

are often irregular, frequently snack, often do not eat breakfast and not lunch.[11]

The effect of hemoglobin levels on cognitive function: The results of the statistical test the effect of hemoglobin levels on cognitive function showed that hemoglobin levels have an effect on cognitive function. The results of the research the value of p = 0.001 (p < 0.05) showed that the levels of hemoglobin is a factor that affects cognitive function below normal. The value of Exp(β)= 0.002 to mean that respondents with anemia then it is likely to have the ability of cognitive function below normal to 0.002 times compared to respondents with hemoglobin levels normal.

Iron deficiency is prolonged it will limit the amount of oxygen carried by red blood cells to the body and the brain. The impact of anemia which is most clearly visible is the reduced ability of concentration, in addition anemia can also interfere with cognitive development and physical.[12] Levels hemoglobin is one of the indicators of the determinant of anemia. Iron deficiency causes motor coordination is disturbed and the concentration of attention or concentration to be decreased. Anemia that occurs in teenager had an impact on the inhibition of mental and intelligence as well as decreased concentration and enthusiasm for learning. [13] The low power of concentration effect on the focus students in accepting and understanding the subjects that can have an impact on learning outcomes. In addition to anemia, a factor that can affect learning achievement is intelligence, learning motivation and learning style.[14] According to the study, iron deficiency with or without accompanied with anemia in infancy is connected with the increasing problem of cognitive function in the aspect of internalization, externalization, and social in teenager.[15]

The effect of psychosocial emotional behavior on cognitive function: The results of the statistical test of the effect psychosocial emotional behavior on cognitive function showed that the psychosocial emotional behavior have an effect on cognitive function. The results of the research value of p = 0.007 (p < 0.05) shows that the psychosocial emotional behavior are factors that affect cognitive function under normal. The value of Exp(β) = 0,022 mean that the respondents with suspicious disorder psychosocial emotional behavior then it is likely to have the ability of cognitive function below normal 0,022 times compared to the respondents with the psychosocial emotional behavior are normal.

Teenager is a period marked by the rapid development of aspects of biological, psychological, and also social. These conditions resulted in a variety of disharmony which requires offsets so that teens can reach the level of development of psychosocial emotional behavior are mature and adequate in accordance with the age level. These conditions vary greatly between the young and show the difference that is individualized.[6]

In general, symptoms of conduct disorder psychosocial emotional behavior can be divided into three kinds, namely disorder externalization, disorders of the internalization and attention disorders. Disorders of internalization in the form of various kinds of disorders such as anxiety, depression, withdraw from social interactions, eating disorders, and a tendency to suicide. Disorders externalization can impact directly or indirectly to others, for example aggressive behavior, defiant, disobedient, lie, steal, and lack of self-control. While attention disorders either do not want to learn, the child cannot be silent, fast switching of attention, both at home and at school. The third interruption of that type have the same effect of the poor against the failure of teenagers learning in school.[14]

A variety of psychosocial stressors often associated with the occurrence of emotional disturbance and behavior in adolescents, such as the presence of physical illness, parenting the inadequate, domestic violence, relationships with peers inadequate, as well as poverty. Psychosocial stressors that affect the process of cognitive development.[16]

Perception, recollection (memory), thinking, and process-cognitive processes that others can be influenced by the emotional state is ongoing in one's self. A person's emotional state can affect the cognitive processes, for example stress, depression, anxiety, and mood. the influence of emotions can occur on any part of the overall cognitive activity of man; ranging from recording information, transformation information, storage of information in the arsenal of memory, then extracting information that has been stored in the memory to appear back in order to give a response to a task, until the process of thinking, problem solving, and creativity.[14]

Conclusion

From this study, we can concluded that the risk factors for female teenager with cognitive function abnormal is nutritional status, hemoglobin levels and

psychosocial emotional behavior. Therefore, it takes the role of all parties such as family, peers, teachers, and government for the prevention and handling of the problem of low cognitive function of female teenager through programs of cooperation with related parties.

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Source of Funding: Self

Ethical Clearance: Female teenager who agreed to be involved in this study signed informed consent. This research has received approved from the Health Research Ethics Committee from the Public Health Faculty of Airlangga University Surabaya by letter No.76/EA/KEPK/2019.

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Life Experience of Adolescents with Thalassemia: A Qualitative Research with Phenomenological Approach

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Abstract

Introduction: Adolescents with thalassemia, an inherited blood disorder resulting in anemia, have multiple problems. Not only do the sufferers have to face developmental issues, but also the challenges that arise from their disease both physically and psychologically. This research aimed to understand the variety of difficulties or problems faced by adolescents with thalassemia in Tasikmalaya, West Java, Indonesia.

Method: This research was a qualitative study. Samples used in this research were 7 adolescents with thalassemia who were chosen by purposive sampling with inclusion criteria as follows: 1) Adolescents with thalassemia aged 11-19 years old, 2) Regularly visit Hospital dr. Soekardjo and. Prasetya Bunda for transfusion purposes, and 3) Willing to be involved in the research. For data triangulation, interviews were also conducted with 3 mothers of children with thalassemia. Data were analyzed using Creswell's 6 steps for data analysis which consist of data transcription, data reading, data coding, reducing information to themes and categories, making data and theme description into qualitative narration, and transforming findings and results into qualitative interpretations and report writing.

Results: From the interviews conducted with adolescents with thalassemia and their parents, several findings were addressed: physical problems that arise from thalassemia are slowed growth and development rate, fatigue and weakness, and pain. Meanwhile, other problems arise in psychological aspects, such as emotional burden, anxiety and sadness about the future and frustration because of feeling different from others. In addition, the research also found that adolescents with thalassemia are experiencing difficulties in social interactions because of bullying and isolation.

Conclusions: This research provides basic information to define proactive strategies for interventions in order to increase the quality of life of adolescents with thalassemia.

Keywords: *Thalassemia, adolescence, quality of life experience, bullying, social stigma.*

Introduction

Thalassemia is a group of genetic blood disorders from synthesis of alpha or beta globin chain either totally or partially. Symptoms of thalassemia are varied based on the amount and effected globin chain type. Thalassemia is commonly found in the Mediterranean, Middle East, India Subcontinent, North Africa, Central Africa and Southeast Asia including Indonesia. The number now has the attention of the Government of

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Indonesia considering that it has seen the numbers of populations with thalassemia and also the fact that Indonesia is one of the countries that has high many thalassemia carriers, with a frequency of 3-8% and up to 10% in several regions. In Indonesia, there are 9082 people with thalassemia and these patients are spread in every region of Indonesia with the highest number in West Java region with 40.3%[4,8,14].

Thalassemia is well-known as a lifetime genetic disorder. The sufferer would experience many problems not only as part of the impact of the disease itself but also from the impact of the medication. Considering the impact of the disease, it is necessary for us to put our attention to the sufferer, especially those in the age range of child to adolescent who have physical maturation and development phases which determine their quality of life[15]. Moreover, adolescents with thalassemia are the most susceptible regarding the social issues because they tend to have dual problems, both physically and psychologically. Besides the impacts from medication, they sometimes are losing control and have the tendency to involuntarily embrace the differences with their normal friends[5]. Other research about adolescents with thalassemia using the Pediatric Quality of Life (Peds QoL) instrument has shown that their QoL only 68.91, and a low rate is also shown on emotional function and school performance, while average QoL from control groups is 79.79[11].To have a better understanding about the experience of adolescents with thalassemia and how they embrace their chronic condition, it is necessary to explore these dimensions with qualitative research.

Method

This research is a qualitative study. Samples used in this research include seven adolescents with thalassemia who were chosen by purposive sampling with inclusion criteria as follows: Adolescents with thalassemia aged 11-19 years old, regularly visit for transfusion purposes, and willing to be involved in the research by completing an informed consent form. For data triangulation, interviews were also done with three mothers of children with thalassemia. Semi-structured interviews were used for the data collection. The research was conducted in 2017 in the Thalassemia Unit of Tasikmalaya Indonedsia. All participants had already been explained about the purposes of the research and completed the consent form before participating. The semi-structured interviews were done in the Thalassemia Unit when all participants were undergoing blood transfusion. The interview took approximately 60 minutes for each participant using interview guide, field notes, and tape recorder to record participants' responses. Data were then analyzed using Creswell's 6 steps for data analysis, which consist of making data transcription, data reading, data coding, reducing information to themes and categories, making data and theme description into qualitative narration, and transforming findings and results into a qualitative interpretations and report writing.

Results

From the semi-structured interviews conducted with six adolescents aged 11-19 years old with education level from elementary school to university with thalassemia and three parents, three common themes from the discussions were obtained, which were physical problems, psychological problems, and social problems.

Physical Problems: It is common that several physical problems are found in people with thalassemia. From several issues, the physical problems were categorized as follows: delayed growth and development rate, fatigue and weakness, and pain. Those categorizations are in-line with the statements of the participants as follows:

"From the physical appearance, it is can be seen that normal adolescents look normal as the way they should, but those who suffer thalassemia there is physical differences from body weight, and body height aspects." (P.5)

"In people with thalassemia, puberty is delayed, unlike normal people. We also suffer delayed growth, especially menstruation, we experienced it delayed compared to normal people, but it is relatively the same between other people with thalassemia." (P.6)

Delayed growth and development in people with thalassemia are also confirmed by parent as follows:

"For body growth, we could see from elementary school to junior high school compared to their relatives, their body looks smaller." (P.1)

Three participants explained how their thalassemia makes them fatigue easily. It is explained as follows:

"Something I feel the most is fatigue, sometimes dizzy... either I do activities at home or at school, I am easily tired." (P.1)

"If my Hb is low, I feel so dizzy, tired, exhausted and sometimes also have fever." (P.5)

"Nowadays I often feel dizzy. I was, maybe once in a month, felt exhausted, but now that I have monthly menstruation, I feel it more often" (P.6)

Physical disorders are also confirmed by parents of adolescents with thalassemia as follows:

"Since being diagnosed with thalassemia for the first time, He has always been weak, easily tired. After having transfusion, it only supports his body for 7-10 days, a week later, he becomes weak again" (P. 2)

Some of participants also experienced pain related to their disease, such as follows:

"During transfusion, I experienced back pain until I have to be treated in hospital." (P.2)

"I have never done any exercise because I could not do much of it. My body become easily exhausted, also there are no friends of mine who have the same things and have big and painful stomach." (P.4)

Psychological Problems: Psychological problems that arose for adolescents with thalassemia can be categorized as follows: emotional burden, anxiety and sadness about the future and frustration because of feeling different from others. Those categories are constructed from the explanations below from patients:

"I once was so angry when I was tired. I was so irritable." (P.2)

"It is so sad and maddening when I was mocked by other people but I cannot defend myself." (P.5)

Emotional burden of thalassemia sufferers was also confirmed by parents as follows;

"When transfusion time comes, they (sufferer) tend to be easily angered, such as when I yelled at them, they were so emotional. I think they just tired." (P.3)

"Other psychological problems experienced by adolescents with thalassemia are anxiety and sadness about the future, explained as follows:

"I am obviously slowly becoming old. I am afraid that my future children will experience the same thing with me and have a lot of friends who are not able to fully embrace my weakness." (P.3)

"I once did not disclose it to my boyfriend because I am afraid that he will not accept me and I'm also afraid of being underestimated." (P.6)

Those arguments are also supported by the statements from parents as follows:

"As my son is growing up, it is undeniable that I have my own anxiety about their future especially about their acceptance and love life in the future. I am afraid that they won't get married because no one will accept them." (P.1)

"I cannot imagine their future." (P.2)

Another psychological problem faced by sufferer of thalassemia is that they feel that they are different from normal people. It is obviously stated from the statements of the participants as follows:

"I have tried getting a job, but it was so difficult for me to get one. For a normal people, getting a proper job has been already a difficult task, then how about people like me? Of course, I feel disappointed with this. I do hope that I will get the same opportunity for job, I want to be like others." (P.4)

"I do feel different from others. If normal people can do anything they want, I have to have transfusion regularly in hospital. I also never had any exercise because I have no friends like me." (P.7)

"I have ever in a condition where I feel abandoned by other people. Maybe it was because I am just being myself, we are different physically." (P.6)

The different feelings towards others are also strengthened by statements from parent about people with thalassemia, as follow:

"In school, their friends are much bigger and taller. I told my child that maybe a miracle will come to us in the future someday." (P.3)

Social Problems: On social interaction issues, people with thalassemia also experience problems that can be categorized as follows: bullying and social interactions difficulties. Those categories are constructed from the explanations below from participants:

"It is a common for me to be mocked at school. I do hope that my friend will never bully me again." (P.5)

Bullying towards people with thalassemia are also reported by parents, as follows;

"Way back from school, they had nosebleed. At first, I think that they have fatigue or something, but when I force them to tell me, they told me that they have been bullied." (P.2)

Bullying is also corroborated by other parents, written as follows:

"Based on their explanation, they often being hit in the head and stomach. Sometimes their belongings, like book, bottle, hat are just thrown by their friends so if my child were trying to get that, they will throw it further. Maybe it is just fun for them." (P.3)

Other social problems faced by adolescents with thalassemia is social interactions difficulties. It is in-line with the explanations of participants as follows:

"I have no friends, maybe just playing around with kindergarten children." (P.5)

The argument is also supported by parents: "I am afraid that they will just be fatigued when they play with my friends, so I asked them to just directly go home to sleep and not play." (P.2)

"In the neighborhood they are only able to play around with younger children, around 5-6 years old or on the 1st or 2nd grade of elementary school. The point is that they are not able to play with their friends." (P.3)

Discussion

This research provides basic information to define proactive strategies for effective interventions in order to increase the QoL of adolescents with thalassemia, especially in physical, psychological and social aspects. The qualitative research with phenomenological approach has produced some themes, such as physical problems, psychological problems, and social interaction problems. Physical problems in adolescents with thalassemia can be categorized by several points that include: slowed growth and development rate, fatigue and weakness, and pain. Delays of sexual developments were reported by 50% of males and females. Glucose tolerance disorder, short body, hypocalcemia, and hypothyroidism also often happen to adolescents with thalassemia. It shows that the effect of excessive iron depends on disease duration and frequency of blood transfusion and slow disease development progress[1]. Other research showed frequent number of growth failures happen in children and adolescents with thalassemia causing body image disorder. The research also highlights the number of events between 30-50% [12].

Psychological problems in adolescents with thalassemia among others are emotional burden, anxiety about future, and feeling different from others. For adolescents and parents who have chronic disease, they face specific problems related to their health issues. Specific problems for sufferers and their parents are feeling of failure and despair about the future, low self-esteem and emotional burden. Adolescents with thalassemia have higher number of psychosocial problems than normal adolescents [10,13.]. Another systematic review also found that several psychosocial problems such as distress, less social function, problems in school performance, feeling guilty, rejection due to disease and/or medication impact are also experienced by adolescents with thalassemia[3].

Social interaction problems experienced by adolescents with thalassemia in this research are bullying and social interaction issue. Bullying happens as an outcome from physical problems experienced by sufferers who position themselves as a victim and an object to be bullied. Self-identity in chronic sufferers can become compromised and their dependency to others become higher than normal adolescents. Those psychosocial problems then impact on adolescents with thalassemia in many aspects such as education, playing time with friends, physical activities, and ability to adapt. Those conditions further impact on the emergence of anxiety, social isolation, and depression. The results of systematic review about bullying prediction on adolescents with thalassemia showed that most bullying is related to their physical condition. One systematic review explained that adolescents with chronic thalassemia who have physical disorders have higher risk to be the object of bullying[6].

Conclusion

The interviews with adolescents with thalassemia and parents provide several themes of physical problems which consist of slowed growth and development rate, fatigue and weakness and pain. Psychological issues consisted of emotional burden, anxiety about the future and feeling different. Social interaction problems consist of bullying, and stigma from looking different. The research provides basic information to define proactive

strategies for effective interventions in order to increase the quality of life of adolescents with thalassemia.

Conflict of Interest: The authors declare that there are no conflicts of interest in this study

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The Effect of Metabolic Syndrome on Systolic Function of Left Ventricle Using Echocardiographic Examination

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Abstract

Objective: Metabolic syndrome may cause bad prognosis on diastolic or systolic function of the left ventricle. Thus, this research aimed to recognize the possible effect of metabolic syndrome on systolic and diastolic function of left ventricle using ECHO.

Study Design: Prospective case-control study.

Place and duration of study: Soad Kafafi Hospital, Egypt, from May 2016 to March 2018.

Methodology: This research included forty patients with metabolic syndrome (18 male, 22 female, mean age=54.13±6.33 years) and forty control matching age and sex volunteers without history of metabolic syndrome disorder (15 male, 25 female, mean age=52.20±5.27).MS was defined according to ATP-NCEP III criteria. Waist circumference will be measured to all participants at the start of study inclusion. Height and weight was measured to calculate Body mass index using standardized formula. Participants underwent laboratory investigations and complete echo cardiography. Left ventricular function of the heart was assessed using Echo cardiographic examination.

Results: There was a statistical significant difference regarding Left atrial (LA) diameter, Interventricular septum and posterior wall thickness in metabolic syndrome patients than normal control persons. The incidence of diastolic dysfunction was significantly higher in metabolic syndrome group compared to control.

Conclusion: MS may cause LV diastolicdysfunction although systolic function was preserved.

Keywords: *Metabolic syndrome, diastolic dysfunction, diabetes, hypertension, left ventricular function.*

Introduction

Metabolic syndrome is defined as a group of interacted risk factors which includetruncal obesity,type II diabetes mellitus (DM), hypertension,high triglyceride level and low high density lipoprotein level[1]. The component ofmetabolic syndrome may be the cause development of cardiovascular disease (CVD) [2]. Its prevalence is further growing in both males and females due to a life style characterized by high calorie consumption and low physical activity [3, 4]. Plandevall et al. recommend routine waist circumference measurement to determine metabolic syndrome and its related diabetes and coronary heart disorders[5]. Interestingly it was found that metabolic syndrome components(diabetes, obesity,and hypertension develop before the development of cardiovascular disease[6]. Previous studies demonstrated that heart failure may occur as a result of diastolic dysfunction although ejection fraction was normal[7]. The mechanisms by which Left Ventricular diastolic dysfunction developed to heart failure were not completely identified. Some proposed mechanisms are that metabolic syndrome may alter function and geometry of the left ventricle which may results in coronary heart disease. Some studies have shown that LV dysfunction independently to metabolic syndrome components. However,some studies have

shown relation between hypertension as a component of metabolic syndrome and increased left ventricular mass inMS patients. Further studies might conduct to define different mechanisms for the development of cardiovascular disease as a result of metabolic syndrome[8].

Methodology

This research included forty patients with metabolic syndrome (18 male, 22 female, mean age=54.13±6.33 years) and forty control matching age and sex volunteers without history of metabolic syndrome disorder (15 male, 25 female, mean age=52.20±5.27). Patients were recruited from the outpatient department at soad-kafafi hospital. Diagnosis of metabolic syndrome was performed according to IDF criteria. According to this criterion MS diagnosed with waist circumference ≥80 cm for women or ≥90 cm for men plus abnormal two parameters of the following: High density lipoprotein cholesterol ≥50 mg/dL for women or ≥40 mg/dL for men; triglyceride levels ≥150 mg/dL and random blood glucose levels ≥100 mg/dL, blood pressure ≥130/85 mmHg.

At inclusion medical history of all subjects was taken then echo cardiographic examination was done for all subjects included in the study. Blood pressure was measured by available sphygmomanometer. Height and weight was measured to calculate Body mass index using standardized formula. Complete lipid profile test, random blood sugar, liver and renal function test and urinalysis using standard operating procedures.

The study approved by ethical committee of Soaad-Kafafi hospital. The exclusion criteria include; Patients suffer from MI, cor pulmonale, atrial fibrillation, cardiomyopathy, valvular heart disease,atrioventricular block hypothyroidism and renal failure.

Echo cardiographic examination wasdone with available machine (GE Vingmed, Horten, Norway) with a 1.5 or 3.2 MHZ phased array transducer. Patients were lying in the left lateral position and breathing gently.A comprehensive echo cardiographic study following standardized protocols was carried for all subjects[9]. Participants are asked to perform passive expiration the whole cardiac movement.

Statistical analysis: Statistical package SPSS version 21 was used for entered of statistical data. Data was summarized using number and percentage for qualitated variables,mean and SD for quantitative variables which are normally distributed while median and interquirtile range formula were used for quantitative variables which are not normally distributed. Independent sample t-test was used for quantitative variables which are normally distributed while non-parametrical Mann-Whitney Test was used for quantitative variables which are not normally distributed. P value<0.05 was considered statistically significant. Normality was checked by Shapiro test.

Results

Table 1: Clinical characteristics of the study groups

Variables	Metabolic Syndrome	Control	P-Value
Age	54.13±6.33[a]	52.20±5.27[a]	.143*
BMI	36.22 ± 7.53[a]	25.55±4.96[a]	<.001*
WC (cm)	119.65±14.36[a]	83.03 ± 7.24[a]	<.001*
SBP	142.50 (130:160)[b]	114.50 (110.00:120.00)[b]	<.001**
DBP	90.00 (80.00:95.00)[b]	76.00 (75.00:80.00)[b]	<.001**
RBS	97.00 (83.00: 143.00)[b]	87.00 (81.00:90.00)[b]	.003**
TG	146.50 (120.00:210.75)[b]	131.00 (113.00:144.75)[b]	.003**
HDL	43.68±8.47[a]	53.10 ±6.56[a]	<.001*

BMI: Body mass index; WC; waist circumference; SBP: systolic blood pressure; DBP: diastolic blood pressure; RBS: random blood sugar; HDL: high density lipoprotein cholesterol.

Indicates a significant *p*-value ($p < 0.05$). mean ± standard deviation ([a]), median (IQR) ([b]), P value by independent sample t-test (*); P value by Mann-Whitney Test (**).

Table 2: Sex distribution among control and metabolic syndrome groups

Sex	Metabolic Syndrome		Control		P-Value
	N	%	N	%	
Female	22	55.0	25	62.5	0.496
Male	18	45.0	15	37.5	

Both gender and age were not significantly different among the two studied groups (Table 1a & b). Regarding clinical parameters, the result shown that both body mass index and waist circumference were found to be significantly higher in patients with metabolicsyndrome group compared to normal control group. The prevalence of hypertension was found to be significantly higher in group I (metabolic syndrome group) compared to group II (normal controlgroup) (Table 1a). Among laboratory investigations, triglyceride level and random blood sugar were statistically significant higher in metabolic syndrome group compared to control group. However, HDL-cholesterol level was found to be significantly higher in control group compared to metabolic syndrome group compared to (Table 1a).

Table 3: Comparison of standard echo cardiographic parameters between metabolic syndrome group and normal control group

Variables	Metabolic Syndrome Group	Control	P-value
LVED(mm)	47.58±5.08[a]	46.48±4.96[a]	.330*
LVES(mm)	29.90±4.83[a]	28.33±4.03[a]	.118*
EF%	68.58±8.48[a]	67.68±5.50[a]	.575*
FS%	37.30±6.26[a]	38.58±8.67[a]	.453*
LA(mm)	38.53±3.83[a]	27.98±3.77[a]	<0.001*
AO(mm)	29.83±4.90[a]	28.23±4.69[a]	.140*
IVS	10.00 (10.00:11.00)[b]	9.00 (9.00:10.00)[b]	.002**
PW	11.00 (10.00:12.00)[b]	9.00 (9.00:10.00)[b]	<0.001**

LVED: left ventricular end-diastole; LVES: left ventricular end-systole; EF% : ejection fraction; FS: fractional shortening; LA: left atrium; AO: Aortic root dimension, IVS: Interventricular septum; pw: Posterior Wall thickness.

Mean ± standard deviation ([a]), median (IQR) ([b]), P value by independent sample t-test (*); P value by Mann-Whitney Test (**).

LVED, LVES,and LV ejection fraction LV fractional shortening were shown to be within normal ranges and no statistically significant difference was detected between both studied groups regarding the previously mentioned ECHO features (Table 2). Additionally, AO was found to be normal within the two groups with no significant difference (Table 2). However, Left atrial anteroposterior diameter, posterior wall thickness and Interventricular septum and were found to be statistically significant higher in metabolic syndrome group compared to normal control group (Table 2).

Table 4: Effect of controlled and uncontrolled hypertension on diastolic dysfunction of the left ventricle

Diastolic Dysfunction	Hypertension						P-Value
	Absent		Controlled		Not Controlled		
	N	%	N	%	N	%	
Present	1	16.7	0	0.0	14	87.5	<0.001
Absent	5	83.3	18	100	2	12.5	

Uncontrolled hypertensive patients show echocardiographic features of diastolic dysfunction which was found to be significantly higher compared to controlled hypertensive patients and normotensive patients.

Table 5: Effect of controlled and uncontrolled diabetes on diastolic dysfunction of the left ventricle

Diastolic Dysfunction	Diabetes						P-Value
	Absent		Controlled		Not Controlled		
	N	%	N	%	N	%	
Present	6	30	1	10	8	80	0.003
Absent	14	70	9	90	2	20	

Uncontrolled diabetic patients show echocardiographic features of diastolic dysfunction which was found to be significantly higher compared to controlled diabetic patients and patients with no diabetes.

Table 6: Effect of controlled and uncontrolled dyslipidemia on diastolic dysfunction of the left ventricle

Diastolic Dysfunction	Dyslipidemia						P-Value
	Absent		Controlled		Not Controlled		
	N	%	N	%	N	%	
Present	5	37.5	3	23.1	7	53.8	.281
Absent	9	64.3	10	76.9	6	46.2	

This table shows that there is no difference in the frequency of diastolic dysfunction among the three studied groups.

Discussion

The term metabolic syndrome (MS) represents a clustering of components including truncal obesity,hypertension,diabetes mellitus anddyslipidemia. Eachcomponent of metabolic syndromemay be considered as important risk factors for the development of cardiovascular disease[10]. Previous literatures study the impact of both insulin resistance and obesity on left ventricular function; however, there is lack of studies that show the impact of MS on left ventricular function. Furthermore, some studies demonstrated that individuals with idiopathic dilated cardiomyopathy were diagnosed with insulin resistance;these studies concluded that MS may cause coronary heart disease[11]. Thus, the present study was conducted to evaluate the impact of metabolic syndrome on left ventricular performance using ECHO.

In the current study, all components of metabolic syndrome were found to be significantly higher in patients with metabolic syndrome compared to normal control group. The analysis of traditional echocardiographic parameters showed that both ejection fraction and fractional shortening which represents left ventricular systolic function were not different among MS patients and normal control group. The major finding of the current study was that metabolic syndrome causes diastolic dysfunction as assessed by standard echocardiographic measurements. Previous studies have demonstrated the effect of metabolic syndrome on the function of left ventricle, but consensus is still lacking. A study by[12] has examined the impact of metabolic syndrome on diastolic function of left ventricle in American Indians using ECHO. They noticed altered of both left ventricular relaxation and of left ventricular diastolic function which is consistent with the current study. Also they concluded that American Indians with the metabolic syndrome had greater posterior wall thickness, left atrial diameter and diastolic dysfunction which are consistent with the current study [12]. In the present study, left atrial diameter of metabolic syndrome group was increased compared to control group, which corresponds to results from other literature[13]. [14] Have shown that left ventricular diastolic function was impaired in MS patients; however ejection fraction and fractional shortening (left ventricular systolic function) is preserved which corresponds to the findings of the present study.[15] Also have shown that only left ventricular diastolic function altered in patients with MS

although systolic function is preserved. In contrast, [16] some studies demonstrated that metabolic syndrome is associated with global left ventricular dysfunction (diastolic and systolic) in subjects with MS but no CVD. Previous studies have demonstrated that diastolic function observed in the current study may be as a result of hypertension. Arterial Stiffness, caused by hypertension may be results in cardiovascular abnormalities [17].In contrast, another study demonstrated that hypertension and obesity were not associated with left ventricular diastolic dysfunction.

4. Watcher et al.,demonstrated that left ventricular diastolic dysfunction occurs at a higher percentage in diabetic patients (80.6%) when compared with patients with no diabetes (69.2%). furthermore, diabetes cause serious effect on the left ventricular diastolic function[18]. In the current study the incidence of diastolic dysfunction rise significantly. The rate of Prevalence of diastolic dysfunction was found to be significantly higher among uncontrolled diabetic patients (80%) compared topatients under glycemic control(10%) and patients with no diabetes (30%). Both studies are comparable. Control of glycemiaby drug or life style modification in diabetic patients can help in maintaining normal diastolic function. According to the Strong Heart Study there was a relation between degrees of glycemic control and diastolic function [19]. However, in the present study glycemic control markers were excluded from the research.

The potential limitations of the present study are a small sample size and lack of randomization.

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The Role of Mean Arterial Pressure (MAP) Roll Over Test (ROT) and Body Mass Index (BMI) in Preeclampsia Screening in Indonesia

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Abstract

Objective: To evaluate the role of MAP, ROT, and BMI in preeclampsia screening in low resources setting.

Method and Material: This is a retrospective study conducted on 1011 pregnant women who had an antenatal care at Public Health Center in Indonesia. Data taken from public health medical report. The sample groups were 45 preeclampsia patients who have had complete screening of MAP, ROT and BMI. The control groups were normal pregnant women who attained same inclusion criteria.

Results: The pre eclampsia group had positif MAP and obesity result respectively 95.6% and 40% of patients, but in control group only had 40% and 11.1% of patient have positive MAP and obesity respectively. Statistical test illustrates a significant association between MAP and BMI screening with the incidence of preeclampsia (p 0.0001, OR = 32.250 and p 0.002, OR = 5.333).Whereas positive ROT showed in 40% PE groups and 57.8% control group. There is no association between ROT screening and the incidence of preeclampsia (p 0.092).

Conclusion: MAP and BMI can be used as baseline screening tools of preeclampsia in low resources setting. But ROT is not associated with the incidence of preeclampsia.

Keywords: *Preeclampsia Screening, MAP, ROT, BMI.*

Introduction

Preeclampsia (PE) is a complex medical disorder, who is is responsible for neonatal and maternal deaths worldwide. It is also becomes the biggest cause of high Maternal Mortality Rate (MMR) in Surabaya Indonesia from 2013-2017[1]. Accurate prediction and aggressive prevention allowed to elude this pregnancy complication. Effective screening to predict PE in the first trimester of pregnancy is important to identify women who are at risk of developing PE so that early enough prevention treatment could start to prevent or reduce the frequency of its occurrence.

Preeclampsia screening vary from clinical to biomolecular level depend on the resources availability. In low and middle income countries where resources are limited, variations of the first-trimester combined test can be considered but difficult to reached. The baseline test which is possible to do are combine of maternal risk factors with Mean Arterial Pressure (MAP) and Roll over Test (ROT). In the absence of other biomarker(s), risk calculation can still be done but the detection rates will be reduced .

MAP and ROT are a method to describe hemodynamic conditions in patients with preeclampsia. ROT is not a perfect predictor, but it still have advantages

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to use in populations with high PIH associated maternal and perinatal mortality, mostly in low resources setting[2]. It has been used in many contries but some literature shows that ROT is not related to the incidence of preeclampsia[3]. The purpose of this study is to determine the effectiveness of preeclampsia screening (MAP, ROT, and BMI) to the incidence of preeclampsia in Indonesia.

Material and Method

This is a retrospective study conducted on 1011 pregnant women who performed an antenatal care at Sidotopo Wetan Public Health Center (*Puskesmas Sidotopo Wetan*), Surabaya, Indonesia from October 2017 to October 2018. Et Data taken from public health medical report. The sample groups were 45 preeclampsia patient during that period time who fulfilled inclusion criteria: patients in the first and second trimesters who have had complete screening of MAP, ROT and BMI. The control groups were normal pregnant women who attained same inclusion criteria. It was takenby consecutive sampling. Positive result noted if MAP is > 90 mmHg. ROT classified as positive result if there were different of diastolic pressure between supine and lateral position more than 15 mmHg[3]. The values on BMI screening classified as obesity if the result >30.The samples were traced retrospectively to see the MAP, ROT and BMI screening history and demographic data.

Finding:

Table 1: Demographic Characteristics

Age (Year)	PE group	Control group	Total
	n (%)	n (%)	n (%)
< 20	0 (0)	3 (6.7)	3 (3.3)
20-35	37 (82)	38 (84.4)	75 (83.3)
> 35	8 (18)	4 (8.9)	12 (13.3)
Parity			
Primi	9 (20)	13 (28.9)	22 (24.4)
Multips	36 (80)	32 (71.1)	68 (75.6)
Risk Factor			
Anemia	3 (6.7)	0 (0)	3 (3.3)
Gestational diabetes	5 (11.1)	2 (4.4)	7 (7.8)
History of Preeclampsia	1 (2.2)	0 (0)	1 (1.1)
Obesity	16 (35.6)	5 (11.1)	21 (23.3)
Tuberculosis	2 (4.4)	0 (0)	2 (2.22)
HbsAg (+)	1 (2.2)	0 (0)	1 (1.1)
History of IUFD	1 (2.2)	0 (0)	1 (1.1)
Under nutrition	1 (2.2)	6 (13.3)	7 (7.8)

Baseline demographics of study participants are presented in Table 1. Most pregnant women in both groups are in reproductive ages. It also worked on parity data, which is multips showed have larger number than nulips. Obesity has the highest rank in PE risk factor in this study. It counts a percentage of 35.6% obesity cases. Followed by Gestational diabetes and anemia.

Table 2: MAP, ROT, BMI and the incidence of preeclampsia

Screening	PE Group	Control Group	Total	P	OR
	n (%)	n (%)	n (%)		
MAP (-)	2 (4.4)	27 (60)	29 (32.2)	0.0001	32.250
MAP (+)	43 (95.6)	18 (40)	61 (67.8)		
ROT (-)	27 (60)	19 (42.2)	46 (51.1)	0,092	-
ROT (+)	18 (40)	26 (57.8)	44 (48.9)		
Obesity (-)	27 (60)	40 (88.9)	67 (74.4)	0,002	5.333
Obesity (+)	18 (40)	5 (11.1)	23 (25.6)		

The MAP test in this study pointed out that 95.6% preeclampsia samples have a value of positive MAP, while only 40% samples of control groups have a positive MAP. This study in accordance with another study by Gasse et al in 2017, which is showed that first-trimester MAP is a strong predictor of gestational hypertension and preeclampsia in nulliparous women[4].

Table 2 also showed that 60% preeclampsia patients have negative ROT screening and are inversely proportional to control group that most of them have positive ROTscreening with p value 0.092 which means that there is no association between ROT measurement and the incidence of preeclampsia.

The results of BMI measurement and the incidence of preeclampsia in this study showed that 40% preeclampsia patient are obese but only 11.1% control group patient recorded obese. Statistical analysis noted p value 0.002 which could be explained that there is a relationship between BMI and the incidence of preeclampsia.

Discussion

Baseline data in this study discordant with the theory of preeclampsia and other study which is reproductive ages and multips are low risk group to have hypertension in pregnancy. It could be explained that reproductive age in this study has preeclampsia risk factor ie gestational diabetes, obesity, history of preeclampsia and infection. Another study from Indonesia also pictured that more than 50% patients who experienced preeclampsia are between 20 to 35 years old[5]**.**Parous women without prior history of PE have lower risk of PE; however, this protective effect will change when they have different conception partner[6].

MAP test showed strong relationship with incidence of preeclampsia in this study, it revealed odd ratio 32.25. This data inline with Poon study in 2008 which reported first study on MAP measurement using validated automated blood pressure devices according to a standardized protocol and maternal variables in 11+0 to 13+6 weeks pregnancy can predict PE.Maternal blood pressure was measured in 5590 singleton pregnant women. the detection ratesfor PE, at 10% false positive rate, were 38% and 63%, respectively for MAP alone and in combination with maternal history[7].

MAP is a reflection of hemodynamic perfusion pressure from vital organs. Another follow-up study on MAP measurement of more than 9000 pregnancies at 11–13 weeks of gestation compared the screening using systolic blood pressure, diastolic blood pressure, and MAP.MAP performed best as a marker, with an increasing of detection rate for early onset PE from 47% (based on maternal factors alone) to 76% (based on MAP and combination of maternal factors) at 10% false positive rate[8].MAP screening in first-trimester is a strong predictor of gestational hypertension and preeclampsia[9,10].

The value of roll-over test has advantages in its simplicity. It requires simple equipment and no special skill. ROT is performed by positioning the patient in a lateral state and then a blood pressure measurement is made until there is no change in blood pressure. Then, the tension is measured in the supine position and the tension results are recorded again.

Some study showed roll-over test are highly variable among different investigators and also inconsistent reproducibility in the same patient. Literature review reveals sensitivities varying between 0 to 93% and specificities between 54 – 91% and false positive results up to 90%. Walia et all study in 2015 also reported roll-over test performed at 24 weeks had negative in all study cases. So, it is clear that ROT has no role as early predictive in preeclampsia[3].

The relationship between preeclampsia and obesity has been greatly studied. Obesity prevalence has increased over 25 years it is similar to preeclampsia prevalence. This study showed obesity has correlation with incidence of PE. It revealed OR 5.3 in obesity cases compare non obesity cases.

This data support substantial evidence which is show that obesity (BMI $\geq$30 kg/m^2) confers a higher risk for PE[10,11,12]. Obesity also state as meta inflammation, associated with chronic stress and inflammatory response. The inflammatory response was found to increase in obese women and contribute to vascular targets and vascular changes induce endothelial dysfunction and placental ischemia in turn exaggerated maternal inflammatory response and induce preeclampsia[13,14,15].

This study in line with FIGO guideline on preeclampsia screening where state that if it is not possible to measure biomarker (PLGF) and/or uterine artery doppler, combination of maternal risk factor and MAP has advantages than maternal risk factor alone. Simple method to measure in Public health will increase

awareness, access, affordability, and acceptance prenatal screening of preeclampsia[16].

Conclusion

MAP and BMI can be used as baseline screening tools of preeclampsia in low resources setting with OR = 32.250 and 5.333. But ROT is not associated with the incidence of preeclampsia.

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Strategic Contribution of Health Services in the Indonesia-Malaysia Border to the National Resilience: Analysis of Implementation in the West Kalimantan Province

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Abstract

Background: The length of "open access" areas from Indonesia which leads to the vulnerability state is the factor that influence terrorism, disease, and other transnational crimes. This study aims to analyze the contribution strategies made by the Government of Indonesia in efforts to equalize health services in the Indonesia-Malaysia border region in order to strengthen health resilience as an important part that is inseparable from national security.

Method: The method used in this study is narrative review of published articles and news related to the policy environment and health service facilities in the border regions of Indonesia and in the other countries that have been published in Scopus-accredited and indexed journals.

Results: It was found that there were obstacles faced by the health providers during the implementation process, including the lack of availability of human resources as health workers as well as health facilities in the border area. As such, many Indonesians living on the border choose to seek treatment in Malaysia. The entry and exit routes from neighbor countries are inevitably becoming vulnerable areas which need attention to prevent various threats from entering the border line which will have an impact on National Resilience.

Conclusions: The fulfillment of human resources availability for health workers and health facilities in the border area has not been maximized due to the difficulty of distribution and limited access. Managing the Indonesian border by relying solely on security and military approaches is not enough, that it requires a multi-sector approach that involves all relevant stakeholders. Good management of border areas is needed as an effort to strengthen Indonesia's national security.

Keywords: *Cross-Border; Health Sector; Health Personnel; Health Facility; National Resilience.*

Introduction

Indonesia has a very long border line, which is around 2914.1 km. The length of the "open access" of the Indonesian border region has resulted in the vulnerability of the state gates to be the entry point for threats that have the potential to disrupt national stability and resilience, particularly in the form of terrorism, diseases, narcotics, and other transnational crimes. Health is an integral part in supporting national resilience.

As the front line, the border community in Indonesia will be the first guard to face the threats coming from the outside. This threat is not only classified as a military threat, but it can also another non-military threat, such as health, which can disrupt national stability and resilience especially in the border region.

Health policies in Disadvantaged Areas, Border and Islands are an integral part of the Government's efforts to accelerate health development, especially in the aspect of equity. The limitations of existing facilities, amount and quality of Human Resources, geographical and weather conditions are among the most important factors in this regard.[1] One of the efforts in accelerating the health development that has been done is providing Social Assistance funds according to the Decree of

the Minister of Health No. 329/*MoH/Reg*/III/2010 concerning social assistance for health services in disadvantaged areas, border and islands year 2010. In addition, the issued Decree of the Minister of Health No. 758/*MoH*/DL/IV/2011 appointed Districts and Primary Health Care in land borders and outer population islands that became the target of national priority programs for health services for disadvantaged areas, border, and islands. Based on the Decree of Health Ministry, 45 regions are designated as the main targets of healthcare programs in DABI. The uneven distribution of health workers in the lower DABI, as in Minister of Health Regulation No. 027 of 2012 concerning health troubled regional disaster management shows that 90 districts/ cities including DABI struggled in health problems. This fact indicates that the public health development index is quite low ranging between the average of -1 (minus one) raw intersection, but has an above average value based on economic status data.[2]

Further to the above issue, realizing the importance of health issues as a threat to national security of a country, the Ministry of Defense of the Republic of Indonesia (MOD) and the Ministry of Health of the Republic of Indonesia (MOH) signed a Memorandum of Understanding on Cooperation in Health until June 26, 2015. This agreement aims to increase the capacity of health institutions in MOD and MOH in implementing health services and health support functions to improve public health as a potential and strength of the national defense. One of the scopes discussed in this agreement is the implementation of health services on DABI. Although the leading sector for non-military threat control in the health sector is held by MOH, MOD is also responsible if the threat has disrupted the country's defense system. To date, MOH and MOD have taken various steps to anticipate the existence of any outbreaks happening both at home and abroad. One of which is to build the infrastructure including the equipment, facilities, and health workers which can deal with non-military threats in the health sector.[3]

Health is an inseparable part of Indonesia's national security. Health is one of the variables of the welfare aspects in the social and cultural context. There are twelve indicators of measuring instruments that are used as parameters for National Resilience in health variables. 8 out of 12 of these indicators have a focus on measuring the quality and quantity of facilities and human resources.

Hence, this study aims to analyze the contribution strategies made by the Government of Indonesia in efforts to equalize health services in the Indonesia-Malaysia border region in order to strengthen health resilience as an important part that is inseparable from national security.

Method

The study was using a narrative review of published articles associated with health services in the Indonesia-Malaysia cross-border area to the national resilience as well as other countries experiences. The study focused on obtaining secondary information sources from the articles published in several accredited indexes in Scopus which were searched by using the keywords of health service, cross-border, Indonesia-Malaysia, national resilience, and Kalimantan. The search was limited to the last 10 years (2008-2018). A critical appraisal of selected articles was performed by using the PRISMA method.

Result and Discussion

Between West Kalimantan and Sarawak, land routes have been opened between countries, namely through Pontianak-Entikong-Kuching (Sarawak, Malaysia) for about 400 kilometers and can be reached in six to eight hours. In the northern part of West Kalimantan, there are four districts that are directly adjacent to Malaysia, namely Sambas Regency, Sanggau District, Sintang District, and Kapuas Hulu Regency, which stretch along the Kalingkang-Kapuas Hulu Mountains.[4]

Based on data from the Central Bureau of Statistics in 2016, there were 244 Primary Health Care units, 899 Supporting Primary Health Care units, and 277 mobile Primary Health Care units in West Kalimantan. The hospital is one of the most vital health infrastructures in West Kalimantan. The number of hospitals in the same year was 45 units with the number of beds available were 4,143 units. In 2015, the total population of West Kalimantan Province reached 4.89 million with a population growth of 1.67 in 2010-2015.[5]West Kalimantan is one of those border areas. State border management is a very important and strategic thing that aims to:

a. Ensuring territorial integrity and upholding the sovereignty of the Unitary Republic of Indonesia;

b. Enforcing the national defense and security;

c. Utilizing the resources and equitable distribution of development and its results for the benefit of public welfare;

d. Building the competitiveness of the border community members to be able to balance the more superior social economic activities of the neighboring countries;[6]

Various threats that disturb Indonesia's national security often occur in the state border area. Based on the mapping carried out by the National Border Management Agency, the most frequent illegal activity in the province of West Kalimantan is illegal border entry and narcotics smuggling. These two activities are serious threats to the Indonesian state which can disrupt the stability of Indonesia's national security.[6]

State border crossing is the entry and/or exit point of people and goods. There are three patterns of crossing people/goods in the state border area. The unofficial crossing pattern has caused disruption to national security stability. Appropriate cross-border management is needed to answer complex and specific problems. State boundary management requires the integration of various elements, including the elements of security, customs, immigration, quarantine, and other elements or supporters.

In the West Kalimantan Region, there are four districts that are directly adjacent to the Malaysian State, namely Sambas Regency, Sanggau District, Sintang District, Kapuas Hulu Regency. The following is the distribution of the number of health workers and health facilities in the four districts:

Table 1: Number of Health Personnel by Regency in 2016[5]

	Medical Specialist	General Practitioners	Dentist	Midwife	Nurse	Total
Sambas	14	47	6	304	386	757
Sanggau	15	38	4	83	182	322
Sintang	24	42	11	50	216	343
Kapuas Hulu	11	50	2	252	456	771

Table 2. Number of Hospitals and Beds in 2016 [5]

Districts/City	Primary Health Care	Supporting Primary Health Care	Mobile Primary Health Care	Hospital	Number of Beds
Sambas	28	92	25	3	330
Sanggau	19	90	21	3	300
Sintang	20	60	51	3	161
Kapuas Hulu	23	85	39	2	145

Health problems in border areas are very complex and considered as a threat that can interfere Indonesia's national resilience, partly because it allows the entry or exit of disease-causing agents. The small number of hospitals and health workers in the border region of West Kalimantan has caused many Indonesians to seek treatment in Malaysia, instead of in Indonesia. Consulate General of the Republic of Indonesia (KJRI) in Kuching, Malaysia, records an average of 300 West Kalimantan residents per day visit a hospital in Kuching, Sarawak, Malaysia for treatment. Even in 2011, there were more than 415,000 Indonesians visiting Sarawak for treatment. Of that amount, the most visited hospitals were Normah Hospital, Timber Lyne, and Kuching Specialist Hospital (KPJ). It is estimated that the number of visits will increase by 8 percent every year.[7]

The elevated level of visit of Indonesian citizens who seek for treatment in Malaysia is caused by the transportation access problems. A resident from Sekayam District, Sanggau Regency, West Kalimantan Province said that the road to the primary health care in Sanggau District was terrible and difficult to pass. This condition causes the cost needed to go there is very high. For example, if he uses an ambulance to go there, it takes around 700 thousand rupiahs and two-hour travel time. Whereas for seeking treatment to Malaysia, he spent at most 7 ringgit, which is equivalent to 25 thousand rupiahs.[8]

The progress of information and technology does not rule out the possibility of causing an increase in the volume of people in choosing treatment. The location of the primary health careis far from the capital and adjacent to neighboring countries causes the population to have the option to go to a neighboring country, even though the primary health care as a health facility has been equipped with adequate health workers and medical devices. Based on the results of interviews in a study conducted by Laksmiarti (2014), there was an Indonesian citizen who lived very close to the primary health care in Entikong (only about 10 minutes), while going to the polyclinic in Malaysia took him 20 minutes from the border. But for a long time, these residents prefer to seek for treatment in Malaysia. According to him, he received excellent service from nurses and midwives at the Malaysian clinic. He spent 200 thousand rupiah for one treatment – 70 thousand for transportation and 100 thousand for medical expenses. He claimed that it was not a problem to spend that much money, provided that the services provided made him comfortable. He did not check himself at the Entikong health center because the health workers at the primary health care were still young because the senior officers and the head of the Primary health care were often not in place. Therefore, he trusted his health and his family's in the Malaysian polyclinic. Moreover, for the people of Entikong, they do not need to use a passport, they only need to provide their KTP to the immigration officers, then they can pass and enter Malaysia.[9]

Based on the above description, it is clear that the border which is not effectively supervised can be used as a gateway to activities that are likely to disturb national security. In the West Kalimantan region, there are three state boundary posts namely Entikong National Budget in Sanggau District, Badau National Budget in Kapuas Hulu District, and Aruk National Budget in Sambas District. There should be a good integration between immigration, customs, and health quarantine in the PLBN, which is one of the functions carried out by the port health office.

Every PLBN is reminded to tighten the supervision efforts on health quarantine to prevent the spread of unwanted diseases. This was emphasized by the Minister of Health of the Republic of Indonesia when he visited the Entikong National Budget in Sanggau District, West Kalimantan in April 2018. Special attention should be given to disease vectors such as animals that come in and out the neighboring countries to be 'cleaned up' before crossing over.

Port Health Office said that in safeguarding the border, the officer has the duty and function to prevent deterrence from the entry and exit of diseases, and to supervise drugs, food, cosmetics, medical devices, and addictive substances. The Head of the Pontianak Port Health Office added that for the land route, the Port Health Office placed several officers in Entikong, Badau, Aruk, and JagoiBabang. This officer is in charge of supervising the people's means of transportation and their luggage. The supervision also includes the corpse that enters. The body must be ensured to not carry an infectious disease agent that can cause emergency. In carrying out its duties, the Port Health Office working area also cooperates with the agricultural quarantine division in the local cross-border posts which is responsible in carrying out operational activities in quarantining animals and plants, as well as animal-based biological safety security.[10]Unfortunately, the existence of this port health work area is not supported by adequate health laboratory facilities in the border area although it was mandated by the International Health Regulation (IHR) 2005 which was updated to be the Global Health Security Agenda (GHSA). The regulation said that in order to maintain global health, each country should have a national laboratory system in the Detect-1 package action. As such, health-related security becomes the concern in the Indonesia-Malaysia border region in West Kalimantan.

Conclusion

One of the problems in the border region is border management that has not been carried out in an integrated manner. The problem of several border areas is still handled ad-hoc, temporarily (temporarily) and partially so as not to provide optimal results. Managing the Indonesian border by relying solely on security and military approaches is not enough, it requires a multi-sector approach that involves all relevant stakeholders. Good border area management is needed as an effort to strengthen Indonesia's national security. Doing so will help to realize not only the third verse of nawacita, which is to develop Indonesia from the periphery by strengthening regions and villages within the framework of a unitary state, but also the third principle of *Pancasila,* namely Indonesian Unity.

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Survival Analysis of Chronic Kidney Failure with a History of Degenerative Disease

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Abstract

Survival analysis is a statistical procedure for analyzing data with variables that are in focus is time until an event occurs. Kaplan-Meier is one simple method to describes a survival curve. Chronic Kidney Disease (CKD) is the 18th cause of death in the World. CKD has been classified as number two catastrophic disease after heart disease. Many studies have been conducted on the survival of CKD patients, but there have not been many studies on CKD based on degenerative disease. The study want to assess the survival of hemodialysis patients with degenerative comorbidities. This retrospective non-reactive design cohort study uses the right sensor. 34 samples were selected according to the inclusion criteria from 155 populations through simple random sampling. Secondary data were taken from the medical record at 2010 to 2015. The estimated survival of CKD patients with degenerative diseases in men reaching 144 weeks and women 132 weeks, patients with a basic education of 112 weeks and an advanced education of 180 weeks, patients working 132 weeks and not working 212 weeks, patient normal nutrition 200 weeks and abnormal 112 weeks. Need screening efforts on CKD, increased endurance, regular exercise and maintenance of nutritional status in hemodialysis patients.

Keywords: *Survival Analysis, Chronic Kidney Failure, History of Degenerative Disease, Kaplan-Meier, Hemodialysis Patient.*

Introduction

Survival analysis is a statistical procedure for analyzing data with variables that are in focus is time until an event occurs[1]. One of the simplest and easiest method of survival analysis is Kaplan Meier. It does not require too much data, only describes the survival curve and descriptive analysis. Descriptive analysis in survival data must be done statistically, because the differences that appear descriptively are not necessarily descriptive. The statistical test used is the Log Rank test. It can show the differences between categories in each factors[2].

Chronic Kidney Disease (CKD) is a public health problem throughout the world[3]. The prevalence and incidence of CKD continues to increase, has a poor prognosis and requires high medical costs. The Global Burden of Disease in 2010 report CKD was the 27th leading cause of death in the world in 1990 and rose to 18th in 2010. In 2016 the global prevalence of CKD reached 13.4% [4]. About 1 in 10 global populations experience CKD at a certain stage. In Indonesia, the treatment of kidney disease is the second largest ranking of financing from BPJS after heart disease. East Java, including number 2, has the highest prevalence of kidney failure, which is 0.3% higher than the national average[5], which is 0.2%[4]. This increase is same with the increasing number of elderly people, the incidence of diabetes mellitus and hypertension.

The number of patients with CKD at Ibnu Sina Gresik General Hospital in 2012 reached 481 patients and experienced an increase every year [6]. Risk factors for CKD include age, gender, history of diabetes mellitus, and a history of consumption of supplemental drinks[7]. Other opinions describe sex, hypertension, diabetes, gout, traditional drug use and a history of kidney stone

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disease as risk factor of CKD[8,9] there is relationship between kidney failure and a history of hypertension, diabetes mellitus, urinary tract infections and urinary tract stones.[10] obesity can increase risk factors for CKD. [11] The high body mass index have the potential for kidney failure. Indonesian Ministry of Health, 2017 reports that triggering chronic kidney failure is Diabetes mellitus, Hypertension, Chronic Glomerulonephritis, Chronic Intersial Nephritis, Polycystic Kidney Disease, Obstruction, Urinary Tract Infection, Obesity, and unknown causes.Indonesian Renal Registry (IRR), (2017) has report from January to October 2016, there were 44.2% of dialysis service facilities in Indonesia that sent data.

Hypertensive kidney disease increased to 37% followed by diabetic nephropathy by 27% [12].Diabetes mellitus (DM) was included in the second cause after hypertension in CKD cases. [13], reported the prevalence of diabetics in Indonesia was 5.7%, but only 26.3% had been diagnosed. This condition is an obstacle in establishing a diagnosis of CKD based on co-morbid diseases, especially DM which certainly requires prior investigation. Risk factors for hypertension and DM are the focus of the study in this study because it has the potential to cause damage to various organ systems if not handled properly. [14]reported the explanatory research that blood sugar levels of 2 hours post fasting independently influence the incidence of terminal renal failure in DM patients.

The highest number is still patients with Hypertensive Kidney Disease (E4), as in previous years. This still needs to be evaluated with regard to the possibility of shifting trends in world epidemiological data, although it is still possible that in Indonesia the etiological distribution of dialysis patients is indeed not similar to other countries.

Method

This study is a non-reactive study, with a type of observational analytic study. Using a retrospective cohort design. Observations use the right sensor calculation (*Right Censoring*). Independent variables of diabetes mellitus and hypertension influence the response variable, namely survival of hemodialysis patients.

The population in this study were 155 new patients at Hemodialysis Poly Ibnu Sina Gresik Hospital. This study uses secondary data of patients' medical records from 2010 to 2015. Inclusion criteria are patients with renal failure who have two degenerative concomitant diseases (hypertension and diabetes mellitus). The sampling technique used was simple random sampling, with a sample size of 34 people. The instruments in this study use the form of data collection sheet and checklist.

Result

The relationship identification between the response and the predictor variables using the Kaplan-Meier method. Failure survival function expressed as reaching failure event (death) and the rate of failure to achieve the death is expressed as a function of hazard. Estimated survival function and hazard function performed by Kaplan-Meier. Characteristics of patient and statistic valuecan be showed on the table 1.

Table 1: Characteristics of Hemodialysis Patients Based on Degenerative Diseases

Characteristics		Status		Median of Survival			P-value
		Censor	No Censor	Estimation	95%		
					Lower Bound	Upper Bound	
Gender	1. Man	7	14	144.00	89.985	198.015	0.892
	2. Woman	5	8	132.00	18.318	245.682	
Education	1. Basic Education (Primary School to Senior High School)	10	20	112.00	55.192	168.808	0.392
	2. Further Education (Diploma to Doctoral)	2	2	180.00	-	-	
Job Status	1. Work	8	18	132.00	83.688	180.312	0.632
	2. Unwork	4	4	212.00	-	-	
Nutritional Status	1. Normal	7	5	200.00	169.826	230.174	0.074
	2. Abnormal	5	17	112.00	56.022	167.978	

Table 1.61.7% of hemodialysis patients are male, have a history of primary education (elementary to high school) (88.2%), work (76.5%), have abnormal nutritional (64.7%).

The female patient have a higher chance of survival than male. Log-Rank test results p-value> 0.05, expain there was no difference in survival time between female and male. Statistically the survival time of male patients is estimated at 144 weeks, while the female reaches 132 weeks. There are differences in the survival life of male and female, the survival life of male hemodialysis patients is 12 weeks higher than women.

Hemodialysis patients with advanced education have a higher survival than primary education (elementary to high school). The results of the Log-Rank test, obtained p-value> 0.05, meaning that there was no differences in survival time of the basic education and the advanced education. Statistically the survival time of hemodialysis patients with advanced education levels has an estimated 180-week and primary education have an estimated 112-week. Hemodialysis patients with working status have a higher likelihood of survival than non-working status. Log-Rank test results p-value> 0.05, there was no difference in the survival time of the working and not working patient. Statistically the survival time of working patient has an estimated 132 weeks and non-working patient have an survival time of 212 weeks.

Hemodialysis patients with normal nutritional had a higher survival than abnormal nutritional. Log-Rank test results p-value> 0.05, show there was no difference in survival time of normal nutritional and abnormal nutritional. Statistically the survival time of normal nutritional has an estimated of 200,000 weeks, while the abnormal nutritional reach 112,000 weeks. So the survival time of hemodialysis patients with normal nutritional is higher. The following figure is the Kaplan-Meier analysis curve based on the predictor variables of hemodialysis patients:

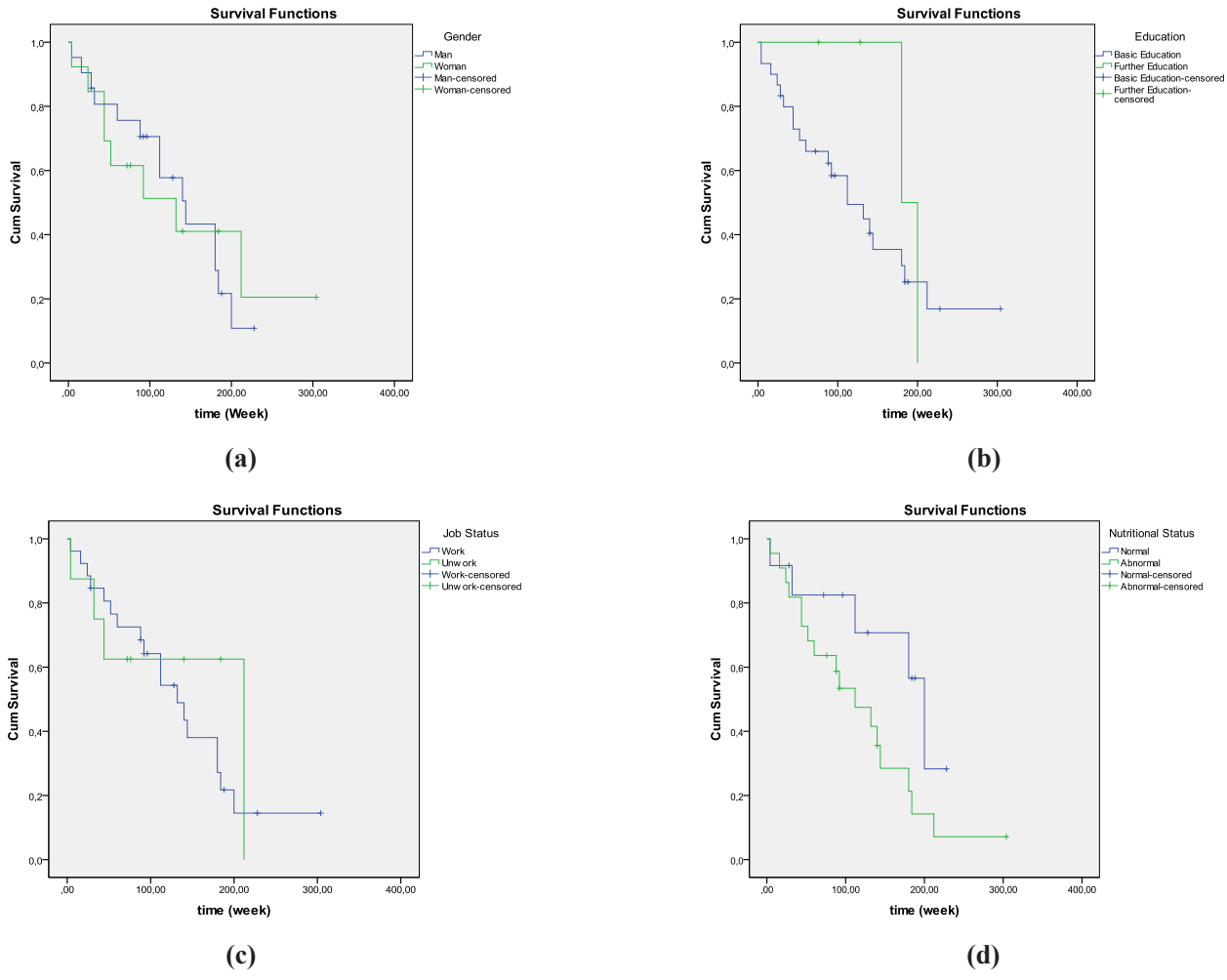

Figure 1. The Results of Kaplan-Meier Analysis (a) Gender, (b) Education, (c) Job Status, (d) Nutritional Status.

Figure 1. Kaplan-Meier curves showed there is a difference in time between two categories, but the curve is merely subjective. Based on statistical values, the Log-rank statistics show the significant variables was Gender, Education, Job Status and Nutritional Status. It concluded that there are no differences in survival time.

Discussion

Hypertension and diabetes mellitus (DM) are the factors that cause death of hemodialysis patients in Ibnu Sina General Hospital. The results of this study was simmilar with the[9] research that there is relationship between kidney failure and a history of hypertension, DM, urinary tract infections and urinary tract stones. [15] has reported that 78.9% of CKD patients have hypertensive comorbidities. Likewise, [8]stated that hypertension, diabetes, gout, can affect the occurrence of chronic kidney failure.

The research of[16], explained patients with CRF caused by DM nephropathy reached 21.9%. [17]reports that 30% of CKD patients have DM and 70% are caused by non-DM. The results of this study also reported that the characteristics of hemodialysis patients, allegedly contributed to the incidence of CKD. According to[8], age, gender, hypertension, diabetes, gout, traditional drug use and a history of kidney stones can affect the occurrence of CKD. [18] explain CKD causes were glomerulonephritis, chronic infections, vascular disease (nephrosclerosis), obstruction (calculi), collagen disease (systemic lupus), nephrotic agents (amino glycosides), endocrine disease (diabetes). [19], show CKD were causes by infection such as chronic pyelonephritis, inflammatory diseases such as glomerulonephritis, hypertensive vascular disease such as benign nephrosclerosis, malignant nephrosclerosis, renal artery stenosis, connective tissue disorders such as systemic lupus erythematosus, polyarteritis nodosa, progressive systemic sclerosis, congenital and hereditary disorders such as polycystic kidney disease, renal tubular acidosis, metabolic diseases such as DM, gout, hyperparathyroidism, amyloidosis, toxic nephropathy eg analgesic abuse, lead nephropathy, obstructive nephropathy such as upper urinary tract: calculi neoplasm, netroperitoneal fibrosis. [7] explain that age, gender, history of DM, and a history of consumption of supplement drinks are risk factors for CKD.

The majority of hemodialysis patients with degenerative diseases were male, had basic education, worked and had abnormal nutritional status. The male patients have a higher survival than female patients. This fact is in line with the Ministry of Health's statement (2017), the prevalence of CKD in men (0.3%), higher than women (0.2%). The trigger factors as background of this fact are the late recognition of early disorders of the kidneys, because CKD initially does not show typical symptoms. Signs and symptoms that arise from kidney disease are very common and can be found in other diseases such as high blood pressure, changes in the frequency of urination in a day, the presence of blood in urine, nausea, vomiting and swelling especially in the feet and ankles [4] In addition [20]states that the characteristics of chronic renal failure in women are slower, and also the occurrence of psycho-socioeconomic barriers such as low awareness of women related to kidney disease and low family income as a cause of female dialysis delay. This condition eventually led to lower prevalence of hemodialysis in women compared to men.

Patients with advanced education levels have higher survival than primary education. This fact is related to the level of understanding of patients which has an impact on patient compliance both in treatment and in patient health care. This result is same with [21] researchthat reported the relationship between the level of education and patient compliance in limiting fluid intake in patients with chronic renal failure with p value 0.019. [22]showed patients with a higher level of education will have broader knowledge and also enable patients to control themselves in dealing with problems they face, have high self-esteem and understand what is suggested by health workers.

The hemodialysis patients who do not work have a longer life than work. It was related to the mind burden of working hemodialysis patients. [23]reported that depression can affect immunological function, nutrition, and compliance factors that can affect prescription and administration of dialysis. Depression can be an independent factor in influencing the survival of hemodialysis patients. Physical activity actually affects the survival of hemodialysis patients, as stated by[24]who reported that there was a relationship between exercise 4 to 5 times a week with an increase in survival life of dialysis patients. [25]explain that low income jobs are prone to cause infections because there is a tendency to consume poor quality of foods.

Patients with normal nutritional have higher survival than abnormal nutritional. [25]stated that good energy intake would not cause nausea and vomiting. The in

adequacy of energy continuously will cause the protein to be broken down into an energy source and cause an increase in the remaining protein metabolism in the form of blood urea. Protein requirements for CKD that get hemodialysis treatment are higher than CKD without hemodialysis. Protein requirements are used to maintain nitrogen balance and replace amino acids lost during the dialysis process. Protein plays an important role as a result of the accumulation of prenatal catabolism in the body when symptoms of uremic syndrome occur [26]

Conclusions

The estimated survival time for male hemodialysis patients is 144 weeks, and women reach 132 weeks, hemodialysis patients with advanced education levels have an estimated 180-week survival time and 112-week for primary education level, working hemodialysis patients have an estimated 132 weeks and not working reach 212 weeks, hemodialysis patients with normal nutritional have an estimated 200 weeks survival time, and abnormal nutritional reaches 112 weeks.

Suggestions: This research is expected to be used as a reference and initial screening for health workers in dealing with chronic renal failure through counseling especially for patients with chronic renal failure with a history of degenerative diseases. providing health education to the community, routine follow-up to working patients, increasing endurance, routine exercise and maintaining nutritional status in hemodialysis patients and can be used as a reference for future studies with variables that have not been studied.

Ethical Clearance: Taken from Health Research.

Ethics Committee: Public Health Faculty, Airlangga University, Indonesia.

Source of Interest: Nill

Conflicts of Interest: Nill

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Capital Knowledge Concept: Accounting Behavior and Health Management in Indonesia

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Abstract

The purpose oft his study is to discuss the accounting behavior oft he capital knowledge concept in which gender and skills playa role in the performance of financial statements. Types and sources Data, this study uses secondary data manufacturing company financial statements in Indonesia from 2009 to 2016. The research met ho de used is a quantitative correlation and variable control for independent variables have a greater influence on financial performance. The results showed that the skill influenced the asset turn over (0.007), current ratio (0.004), cash ratio (0.001), and fixed asset turnover (0.002) and Gender had an effect on financial performance. DER (0.048), Asset turnover (0.000), debt ratio (0.005) and ROA (0.045). Originality research, capital knowledge concept plays an important role to improve the performance of corporate financial statements.

Keywords: *Capital Knowledge, Accounting Behavior, Financial Performance.*

Introduction

Aboard of directors provides strategic direction using their networks to provide resources for the organization[4,7,15,25,36,44]. To improver elations hips with shareholders and other externals take holders, a board of directors must be more strict in delegating operational management,operational management balance accountability at the management level. Business is a multi-dimensional partnership and openness is essential to building trust;the relationship between owner and manager,shareholder relationship and asymmetric bondholders information between both parties leads to agency conflict and agency costs[14,19]. The feature of the company's condition means that the owner oft he company cannot observe and therefore he monitors all managerial actions,the bondholder cannot observe managerial and shareholder actions, because he limits them from potential actions that endanger the wealth of the bondholder.

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The important role of free cash flow in investment decisions Investor's decision to invest is subjective[10,21,22,23,24]. The decision depends on the expected cost,decision depends on the expected cost techniques and his perceived risk, which is entirely a subjective factor[1,6,34,43,50]. For good investment decisions, investors need to fully understand and correct the opportunities that may occur and this decision should not bed one in a hurry. A wrong investment decision can cause the company to even bankruptcy. It is important to understand the basic idea of investment decisions to get the most value from the assessment process. In the investment evaluation, indicators should be selected on the specific nature of the project and profitability[3,11,17,37,38,42,33,36,41,45]

Material and Method

The method used is the quantitative correlation between independent and dependent variables and control variables. This study is to assess financial performance[13,16,22,24,30,31,37,5,18,32,39,46]

Data Collection and Samples: This study is quantitative correlation research using secondary data such as financial statements Manufacturing companies listed on the 2009 to 2016.

Variable Measurement:

Variable Independent:

a. Skill[2,9,27,45], to develop the agency theory,it is important to consider human capital, external social capital and internal social capital to develop board capabilities called Aboard capital, ie the ability of knowledge,skills and ties to impact company performance[8,12,25,]

$$\textbf{Skill}_S = \beta_0 + \beta_1 \text{ firmsize}_t + \beta_{2a} \text{ board of direct}_{ors} + \varepsilon_t$$

b. Gender,directors purpose $\beta_0 + \beta_1 \text{firmsize}_t + \beta_{2a}$ **board of director** $_t + \varepsilon_t$

Where:

Firmsize=Log (sales)

A board of directors= average of aboard to year

Dependent variable

Variable dependent corporate financial performance[8,18,35,36,39,44,47,51]. In this research use 9 indicators that is DER, Profit Margin,Turnover Asset, Current Ratio, Cash Ratio, Debt Ratio, NPM, Fixed asset turnover and ROA.

$$Y = \beta_0 + \beta_1 \text{ Skill}_t + \beta_2 \text{Gender}_t + \beta_3 \text{firmsize}_t + \beta_{4a} \text{ boardof director}_t + \varepsilon_t$$

Findings:

Correlationof Skill to Financial Performance: In this study, thes kills proxiedin Ph.D. statements. From the table below shows the skill effect on (0.007), current ratio (0.004), cash ratio (0.001), and fixed asset turnover(0.002).

Gender Correlation to Financial Performance improve the impact of corporate governance reform on its (0.048), Asset turnover (0.000), debt ratio (0.005) and ROA (0.045).

Discussion

The Board of Director's Performance Assessment differs from company performance as evidenced by annual financial and disclosure reports. The role of the Board of Directors is broader than that characterized by the agency's control paradigm. Board of direct directors involved in the corporate strategy includes, that is Overseeing managers as fiduciary shareholders, Advising CEOs and top management on strategic issues, Feedback and guidance to the CEO; and Think of it as a source of external knowledge. Collaborative work experience, expertise,reputation,politics, and organizational knowledge reflect the board of director's more effective performance dimensions [8,39,52] Characteristics of a board of directors are also important indicators of a board of director's performance appraisal.

Skill Sets Represented: To develop the agency theory, it is important to consider human capital, external social capital and internal social capital to develop board capabilities called Aboard capital, the ability of knowledge, skills and ties to impact company performance[8,12,25]. This allows the board to function as a cohesive team that implements and mobilizes resources derived from human capital,board members and external social capital[33,35]. The composition oft he board of directors also affects the performance oft he company[18.] During the process of recruitment oft he board of directors, new members are assessed fort heir ability to contribute the required technical skills; arole-fit[12]

H1 = skills with education Ph.D. effect on financial performance

Gender: The gender component of a board of directors has become an obligation of its purpose is to improve the impact of corporate governance reform on its performance. Corporate Governance has been identified as a very intense and controversial area of business administration literature. For managers, shareholders and policy makers the role of corporate governance affects the company's performance. Previous research has shown that a large number of boards impacts on better performance and has implications for multinational corporations[5,18,32,39,46]

H2 = Gender in the board affect the financial performance

Conclusion

Ph.D. and Gender Education has an influence on the performance of financial statements. From the table below shows that Ph.D. Education has an effect on Asset Turnover (0.007), Current Ratio (0.004), Cash Ratio (0.001), and fixed asset turnover (0.002) and Gender influences financial performance. DER (0.048), Asset turnover (0.000), debt ratio (0.005) and ROA (0.045). then the approach to accounting behavior of Ph.D. and gender education can affect significant financial performance.

Conflict of Interest: The Author (s) declare that they have no conflict of interest.

Source of Funding: Others source.

Ethical Clearance: This study was approved by the institutional review board of institution of Airlangga University The research received a certificate from Airlangga University.

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Early-Onset Neonatal Sepsis in Low-Birth-Weight and Birth-Asphyxia Infants at Haji Hospital Surabaya, Indonesia

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Abstract

Introduction: The incidence of early-onset neonatal sepsis is still high, therefore special attention is needed early detection of risk factors for early management. Many risk factors could affect early-onset neonatal sepsis such as birth-weight and birth-asphyxia.

Aim: This study explored the risk factors for early-onset neonatal sepsis among neonates at Haji Hospital, Surabaya City, Indonesia.

Method: This study was observational analytic with a cross-sectional design. The data used retrospective document review was conducted in NICUs of Haji Hospital, Surabaya City, Indonesia. 1.461 infants were born from January 2018 to December 2018. The data analysis of this study was the Chi-Square Test and Multiple Logistic Regression Test using SPSS for windows v.17.

Result: This study involved 1.461 infants with one hundred seventy-eight suffered of sepsis. The study found out that low-birth-weight and birth-asphyxia were significantly associated with neonatal sepsis ($p<0.001$). Last, the result of multiple regression analysis showed that early-onset sepsis was influenced by low-birth-weight ($p<0,001$; RR: 10.405; CI: 6.346 to 17.061) and birth-asphyxia ($p<0.001$; RR: 17.038; CI: 10.644 to 27.271).

Conclusion: The neonatal sepsis was influenced by low-birth-weight and birth-asphyxia. Based on these results we recommend to focus on the intensive treatment for infants who suffered asphyxia and had low-birth-weight.

Keywords: *Neonatal sepsis; low-birth-weight; birth-asphyxia.*

Introduction

Infant Mortality Rate (IMR) is an indicator that reflects the state of health in society including Indonesia and is a sensitive benchmark of all management efforts undertaken by the government, especially in the health sector[1]. IMR in Indonesia in 2015 was still high at 22.23 per 1,000 live births while in East Java the IMR in 2014 reached 26.66 per 1000 live births[2]. IMR in East Java decreased compared to the previous year but it was not significant, namely in 2013 several 27.5 per 1000 live births. IMR in the city of Surabaya in 2015 amounted to 6.48 per 1000 live births. This figure has increased compared to 2014 which was 5.62 per 100 live births. The United Nations set this indicator on the 2030 Suistanable Development Goals (SDG's) at point 3, namely in 2015-2030, which is to reduce the infant mortality rate to at least 12 per 1,000 live births.[3].

According to WHO in 2016 neonatal deaths account for 45% of child deaths under 5 years. The majority of all

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neonatal deaths (75%) occur in the first week of life, and between 25% to 45% of neonatal deaths occur within the first 24 hours. Almost all (98%) of five million neonatal deaths occur in developing countries. Neonatal sepsis accounts for nearly 80% of neonatal deaths[4].

Sepsis was initially defined as a suspicion or proven infection accompanied by clinical conditions of SIRS (Systemic Inflammatory Response Syndrome) but the definition is now abandoned. As per the consensus regarding the latest sepsis, sepsis is defined as a state of life-threatening organ dysfunction/failure, caused by an unregulated host response to infection. The cause of early onset neonatal sepsis is different from the cause of slow onset neonatorum sepsis. The cause of SNAD is microorganisms that are transmitted vertically from mother to baby, both before and during labor[5].

As per the consensus regarding the latest sepsis, sepsis is defined as a state of life-threatening organ dysfunction, caused by an unregulated host response to infection. Neonatal sepsis is divided into two namely early-onset neonatal sepsis (age <72 hours) and advanced (age> 72 hours)[6]. Early-onset neonatal sepsis causes high morbidity and mortality in newborns. The incidence of early-onset neonatal sepsis is higher in developing countries (1.8 to 18 per 1000 live births) than in developed countries (1 to 5 per 1000 live births). The case fatality in EONS ranges from 16.7% to 19.4% [7]. The incidence rates of neonatal infection in several referral hospitals in Indonesia is approximately 8.76% –30.29% with the mortality rate is 11.56% –49.9%. The incidence rates of neonatal sepsis in several referrals hospital in Indonesia is 1.5% –3.72% with the mortality rate is 37.09% –80% [5].

In Haji Hospital Surabaya there was an increase in cases of newborn infections in 2015-2017 to 21.50%. Several factors of mother, babies, and environment are contributed to the infection exposed and non-optimal of NM immunologic response so as the newborn become susceptible to be infection[8]. The objective of this study is to explore the risk factors for early -onset sepsis among neonates at Haji Hospital, Surabaya City, Indonesia.

Material and Method

This study was observational analytic with a cross-sectional design. The data used retrospective document review was conducted in NICUs of Haji Hospital, Surabaya City, Indonesia. 1.461 infants were born from January 2018 to December 2018. The independent variables of this study were birth-weight and birth-asphyxia. The dependent variable of this study was early-onset sepsis.

This study used SPSS Statistics 17.0 for data analysis. Bivariate analysis was correlated using cross-tabulations and Chi-Square Test with α=0.05. A multivariable logistic regression model was created to examine the causal association between independent variables and breast milk production using Multiple Logistic Regression with α=0.05. This study was received ethical approval from the Health Research Ethics Committee, Faculty of Medical, Universitas Airlangga.

Findings: Most of the 928 infants (63.51%) were female while almost half were 533 infants (36.48%) were male. Almost entirely, 1353 babies (92.61%) were born with clear membranes while only a small portion, namely 108 babies (7.39%) were born with turbid green membranes.

Furthermore, almost 1350 babies (92.40%) were born full term and a small part, namely 107 babies (7.30%) were born with a premature period as well as babies born over time (postdate) only a small portion, 4 babies (0.30%). Other data show that almost all 1340 infants (91.72%) had no low birth weight (LBW) while only a small portion, 121 babies (8.28%) were born with LBW.

The data of asphyxia in infants shows that almost all of 1333 infants (92.61%) were born not asphyxia while only a small proportion of 128 infants (8.76%) experienced asphyxia. And it shows that almost all 1420 babies (97.19%) were single born and only a small portion, 41 babies (2.81%) were born twin (multiple)

Based on data which fulfill our inclusion criteria. These are the result.

Table 1: Bivariate analysis between independent variables and early-onset sepsis

Variables	Early-Onset Neonatal Sepsis				Total		p
	EONS		Non-Sepsis				
	n	%	n	%	n	%	
Birth-weight							
Low (< 2500 gram)	76	42.7	45	3.5	121	8.3	< 0.001*
Normal (> 2500 gram)	102	57.3	1238	96.5	1340	91.7	
Asphyxia							
Yes	87	48.9	41	3.2	128	8.8	< 0.001*
No	91	51.1	1242	96.8	1333	91.2	

*Significantly correlate using Chi-Square Test ($p < 0.05$)

Table 2: Summary of multiple logistic regression

Variables	B	SE	P	RR
Birth-weight				
Low	2.342	0.252	< 0.001*	10.405
Normal (Reference group)				
Asphyxia				
Yes	2.835	0.240	< 0.001*	17.038
No (Reference group)				

*Significantly associate using Multiple Logistic Regression Test ($p < 0.05$)

This study involved 1.461 infants with one hundred seventy-eight suffered of sepsis. As shown in **Table 1**, there was a correlation between LWB and neonatal sepsis ($p<0.001$). Most of infants who had normal weight (96.5%) did not suffer sepsis than infants who had LBW. In contrast, almost half of participants (42.7%) who had LBW were suffer early onset sepsis highly than infants who had normal weight. It could be concluded that the early onset sepsis was more suffered by infants who had low-birth-weight (less than 2500 gram).

Table 1 also shows that there was a correlation between asphyxia and neonatal sepsis ($p<0.001$). Only 3.2% (n=41) infants who are getting sepsis were infants who had asphyxia. In contrast, almost half of participants (48.9%) who had asphyxia were suffered early onset sepsis highly than normal infants. It could be concluded that the sepsis was more suffered by infants who had asphyxia.

Table 2 shows that the results of multivariate analysis with Multiple Logistic Regression Test ($\alpha = 0.05$). The result showed that neonatal sepsis was influenced by low-birth-weight ($p<0,001$; RR: 10.405; CI: 6.346 to 17.061) and birth-asphyxia ($p<0.001$; RR: 17.038; CI: 10.644 to 27.271).

The infants who had LBW were at risk for getting early onset sepsis 10.405 times greater than infants who had normal weight. Then, infants who suffered asphyxia were at risk for getting early onset sepsis 17.308 times greater than infants who not suffered asphyxia. So that, asphyxia most likely has an influence.

Discussion

Following approval from the institutional ethical committee, almost half of participants (42.7%) who had LBW were suffering early onset sepsis highly than infants who had normal weight. It could be concluded that the early onset sepsis was more suffered by infants who had low-birth-weight (less than 2500 grams).

The results of this study are in line with the results of a research namely LBW has three times the risk of developing sepsis than non LBW[9,10]. This is in line that infants with sepsis had more low birth weight (85.7%)[11]. The central regulation of breathing is not perfect, the respiratory muscles and ribs are still weak in LBW infants resulting in less oxygen entering the brain, if oxygen is lacking, anaerobic germs easily develop which causes easy infection. In contrast to research conducted by Rahmawati in Dr. M. Djamil Padang Hospital, the

results showed that there was no statistically significant relationship between birth weight in the form of low and normal categories with the incidence of neonatal sepsis. A significant relationship appears in LBW infants with prematurity where the maturation of their organs (liver, lungs, enzymes, digestion, brain, immune system against infection) is not perfect, so LBW babies often experience complications that end in death[12,13].

Then, infants who lived asphyxia were at risk for getting early onset sepsis 17,308 times greater than infants who didn't live asphyxia. So that, asphyxia most likely has an influence to. Neonatal asphyxia facilitates systemic infections. This is due to inhibited leukocyte activity because it requires energy (ATP) for cytoskeletal microfilament contractions. The state of hypoxia will also inhibit the microbicidal activity of *polymorphonuclear* cells[14]. Neonatal asphyxia increased the risk of EONS with a positive blood culture result 4-fold (RO = 4.102; 95% CI 1.04-16.14)[15,16].

Neonatal asphyxia was assessed by examining APGAR scores. A low APGAR score increases the risk of EONS. Research conducted by Muhammad et al in 2015 found that Apgar scores <7 in the first minute had a risk of 14.05 times (95% CI 5.487-35.987) for EONS events[17]. APGAR scores <7 in the first minute were also reported by Shah et al., which were significant with each OR being 5.7 for EONS eventsc. In general, the first minute APGAR score is associated with *Potential Hydrogen* (pH) umbilical cord blood and intrapartum depression and is not related to the results, whereas the APGAR score then reflects changes in the baby's condition during resuscitation[10,18].

Asphyxia neonatorum is very closely related to health problems of pregnant women, including infections. Babies with asphyxia neonatorum appear unfit and have a history of fetal distress before birth. Neonatal asphyxia facilitates systemic infections. Neonatal asphyxia increases the risk of early onset neonatal sepsis with positive blood cultures. In addition, low birth weight babies, including this risk group. Most problems occur in infants who weigh less than 1500 grams with high mortality and require special medical care and treatment for infants at 2.75 times higher risk of neonatal sepsis[10,13,16].

The diagnosis of early onset neonatal sepsis is very important in the management and prognosis of the patient. Delay in diagnosis can potentially threaten the survival of the baby and worsen the patient's prognosis. The prognosis of neonatal sepsis depends on diagnosis and therapy. The prognosis of neonatal sepsis is good if the diagnosis is made early and the therapy is given appropriately. Mortality rates can increase if clinical manifestations and risk factors for neonatal sepsis are not well identified. Midwives and doctors play an important role in efforts to improve the health of mothers and children, especially in clinical cases[19,20].

Conclusion

The neonatal sepsis was influenced by low-birth-weight and birth-asphyxia. Based on its conclusion, it is suggested to Health Service Centre to focus on the intensive treatment for infants who had low-birth-weight and suffered asphyxia. It is also suggested to society, especially for husband, to keep supporting the pregnant-mothers for check their pregnancies regularly.

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Humanoid Robot Integration in Rehabilitation of Musculoskeletal Conditions

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Abstract

Robots find numerous applications in medical/health domains and are extensively used in commercial as well as domestic applications to support daily life activities. Human robot (HR) has widened their wings to be used in rehabilitation applications. Interest in robots that provide health care is growing as one of the upcoming fields of next generation. In this study we investigated the Robot -patient performance in physical rehabilitation. A group of musculoskeletal patients diagnosed with pain in muscles or joints or both, aged 20 to 65 years was chosen for the study. The robot was programmed to instruct and guide the patients for physical rehabilitation activities for three trials of 30 minute sessions on different days. The sessions involved interaction with a humanoid robot. Robot was programmed for a set of active exercises with a classified sequences that are time and motion managed. Verbal communication between the robot and patients allowed for re-start, stop, resume and replay functions. The whole performance was filmed and reviewed from the perspectives of the impact on the patient as well as the performance of the robot. The whole process was validated by performing the same procedure on a trial basis with healthy individuals to ensure the setup is operated smoothly. The performance of each variable was evaluated in three successive sessions. Evaluated functions include clarity, therapy sequence, interaction, voice, timing, independency, operation, technical performance and degree of freedom. Results were computed as percentages by an external assessor. Results demonstrated dynamic learning in the 1st and 2nd sessions which showed a remarkable improvement in the 3rd, 4th and 5th sessions. The overall average of the performance for the last 3 sessions was 91+%. Referring to this outcome, it could be concluded that the robot may have the potential to influence the physical therapy imitation. However,to establish the extent of this influence affirmatively, a bigger sample will be needed with a wider variety of patients.

Keywords: *Humanoidrobot, interaction, integration, rehabilitation, musculoskeletal.*

Introduction

Robots are being designed to complement human skill sets, reduce workload and enable professionals to focus on more important activities that have a greater impact on patient care delivery. As this technology advances and becomes more affordable, we can expect more health care institutions to adopt robotics.

Robots are still not a replacement for human interaction. Hospital operations are complex and involve uncertainty. Robots are good for performing repetitive tasks and tracking data, but this technology should only be used to make the clinicians' workflow easier so that they may focus on the most critical part of their jobs, which is caring for patients.

Advanced humanoid robots are employed in a variety of applications in medical/health domains and are also used extensively in commercial establishments as well as in the home support for daily life activities. Beyond the traditional scope, robot can be engaged in the rehabilitation process and it is poised to become one of the most important technological innovations of the 21st century. Literature showed specific uses with elderly patients and some pediatric applications.[1,2]

In this article, we offer a trial study on the possible uses of robots in rehabilitation, particularly in the management of musculoskeletal conditions.

Human Robot (HR) has widened their wings to be used in rehabilitation. Interest in health care robots is

growing as one of the upcoming fields of next generation in this smart industry, especially as assistive tools in rehabilitation[1]. It is believed that humanoid Robot promises excellent experience for CP children to learn motor tasks[3]. Many studies involving CP children investigated robotic exoskeletons[4] to replace or support function. There is still a lack of intervention therapy which involves complicated functional tasks.

Some of the robotic technologies were designed to assist the user primarily through social rather than physical interaction[5]. For example, a previous study[6] has established Kindergarten Assistive Robotics (KAR) as a tool for learning and development for normal children in preschool education. KAR has increased children's motivation and communication during the interaction. Robots have been successfully introduced into physical therapy and rehabilitation of children with disabilities[7,8,]. Thus, KAR is suggested to be applied for CP children. One of the studies involved KAR as a Robotics Agent Coach for CP motor Function (RAC CP FUN)[9]which is designed to improve their motor functions and activities associated to daily living. Further, anotherstudy[10]employed a mobile robot named "Neptune" and used a toy robot named "Cosmobot" and the derived results showed that robot can become a social mediator for learning. The results of a study [11,12]that used Lego Mind storms robots[13] for CP children's play activities demonstrated that the children reacted positively toward the robots, while some children increased their attention span and could be better engaged when they used the robots. However, most explored robotic systems earlier were mainly in the form of toys, and not in humanoid form. Thus, this study is designed to use a humanoid robot to instruct patients in physical therapy sessions with musculoskeletal problems. An expert software programmer and a physiotherapist jointly developed the therapy program. Details of the therapy were tailored specifically to meet the needed conditions, interact with the patients, with the mode and specification capable of offering several options.

Methodology

The intended group is a set of musculoskeletal patients diagnosed and referred for P.T clinic. A strengthening exercise was prescribed and endorsed by a licensed physiotherapist specialized in the musculoskeletal disorders, This particular group was for improving the back strength, with age range between 20 to 65 years. Other inclusion criteria were no physical or mental disability, no hearing and vision deficiency, and a cognitive ability to follow simple commands in English. Signed informed consent was obtained from the participants. Five trials, each of 30 minutes session were performed on different days. The sessions involved interaction with humanoid robot. The experiment protocol was approved by the Occupational Therapy Association Research Board. The robot was programmed for a set of active exercises with a classified sequence managed in time and motion. Verbal communication between the robot and patients allowed re-start, stop, resume and replay functions. The robot was equipped with 4 cameras and programmed to take photos of the patient's face and voice print to enable individual recognition in order to recall the personal therapy program and update the patient information at the end of the session. The whole performance was filmed and reviewed from the perspectives of both the patient and robot. The whole process was validated by performing the same procedure on a trial basis with healthy individuals to ensure the setup is operated smoothly.

Patients were educated about the robot and the study aim. An introduction session was made to familiarize the group(robot, patient, operator and the assessor) with the study methodology. The study was conducted in a simple gym, with the exercise mat laid on the floor for the patients and the NAO was placed on the non-slippery floor. The performance assessment will use met partially me or not met.

NAO has 23 degrees of freedom: 2 degrees of freedom for head, 4 degrees of freedom for each arm, 1 degree of freedom for pelvis, and 5 degrees of freedom for each leg.

Result

The aim of this robotic-patients application is to instruct patients with musculoskeletal problems for several pre-structured and programmed exercises. The overall aim is to measure several factors that govern the robot-patient performance, e.g. clarity, sequence, interaction, voice, timing, independency, operation, technical performance, and degree of freedom. The assessment is expressed by% of excellence for the three times and then the% average is gathered for all patients. The total for each parameter in each session and the total for the five patients for each session is presented. The data in the table below is the grand total for the three sessions for five patients and expressed in %.

Table 1: The data here is representing the% of performance of each item. The performance of the last three visits are averaged in the last column and the grand average for the overall performance (91+) is also presented. The 1st and 2nd sessions were considered as learning sessions.

Item	Trial sessions		3rd session	4th session	5th session	Average %
	1 st session	2nd session				
Clarity	50%	70%	90%	95%	95%	93+
Therapy sequences	30%	60%	90%	90%	100%	93+
Interaction	20%	60%	95%	95%	95%	95
Voice	70%	70%	80%	90%	95%	88+
Timing	40%	60%	100	95%	100%	98+
Independency.	60%	80%	80%	90%	90%	86+
Operation	70%	90%	90%	90%	95%	91+
Technical performance	90%	90%	90%	90%	95%	91+
						Grand 91+

Consequently, there are few points to be highlighted and discussed. The data presented represent the external assessor evaluation of the performance. It is clear that the 1st session is a learning step which shows low levels of performance. Second session showed remarkable improvement and a continuous improvement is recognized in the 3rd session. The overall impression is supporting the fast and reliable interaction integration. The total performance related to the robot therapy assignment is seen as highly satisfactory and manageable with the patient acceptance of the whole process.

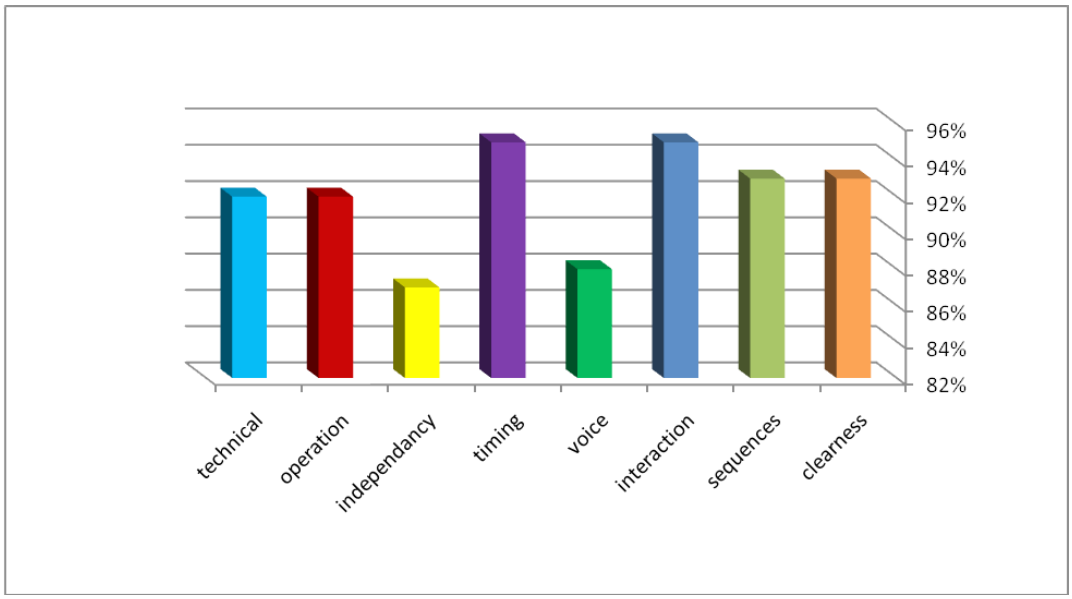

Fig. 1: Shows the representation of various performance parameters. This indicates the average percentage of the last three sessions.

Fig 2: A, and B, The robot is oppositely facing the patient to assure face to face communication, both in lying position. The robot NAO asks the patient to imitate each movement. NAO starts to perform the exercise and patient is expected to follow, patients should match the time in a steady sequence and follow and repeat for several times matching the robot command. The robot is watching the patient through the cameras and has the capability to stop, rectify, adjust and resume.

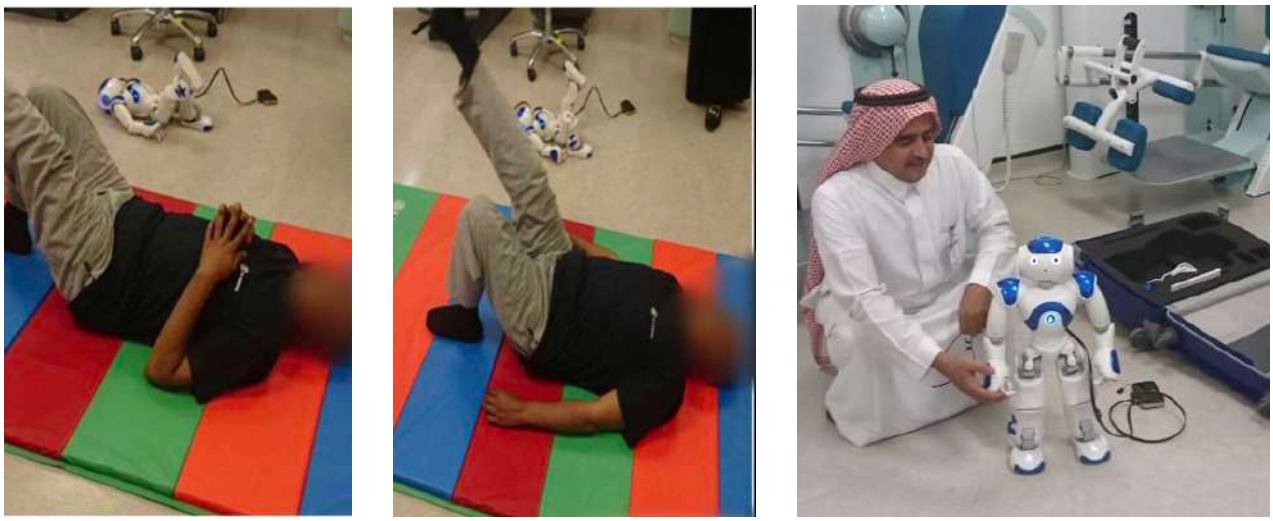

Fig 3: The instructor checks and makes sure that NAO is ready

Discussion

The set up of this robot rehab program was made to serve patients at the clinic or at home. The overall performance was great,smooth and relatively reliable in this small trial group. This work encourages interest groups to proceed with robot rehab therapy. The available data from this trial study showed the robot-patient performance and the technical performance as well as the operational performance. The imitation of movement simultaneously with the robot confirmed the possibility of independent execution of serial therapy program in the rehab clinic or at home particularly for chronic conditions. The total percentages core of the last three sessions was around 92. However, further optimization of the robot programming and proper prescription of exercise program and careful selection of patients could make the work performance highly efficient. Each of the eight parameters of this study were assessed in five different sessions. These parameters are believed to be the most important factors to govern the implementation. Optimizing them will enable the robot to work independently with the patients at the clinic or at the home and this will enable to personalize this technology and the outcomes[7,8] are in line with this result.

It is worth saying that the interaction was very successful and the options of stop, resume, restart were used many times to cater to patients' requests, and this was considered healthy. The clarity of steps and voice level was perfect and the patient's follow-up on sequence was also maintained to a high level. Progressing with time is a notable and clear indicator which means that the patient-robot relation is supporting the level of confidence of the patient as well as the therapist, and this matches earlier reported outcomes[13]. This is an improvement of the technology with a friendly perspective. The overall satisfaction of the patient and the acceptance were high and very promising. The grand total performance of all eight parameters was very high(almost 92%) which substantiates its applicability in the clinical robotic industry in line with the[16,17,18].

This article is meant to cover solutions at different stages of applications. Thereafter it is up to the developer to commercially make it ready and available in the market or to look to some alternative or to go for more phases of research and experimentation. The existing data provides examples and pointers to proceed to clinical applications and other major ingredients for the success of these applications as well as the main issues surrounding their adoption for a wide range of everyday physiotherapy use are to be developed further. We have examined how robotics could partially fill in some of the identified gaps in current telehealth-care through internet connectivity since the robot is equipped with 4 Cameras and can recognize individuals by face and by voice tone. Introducing a tele control can pave the way for program modification and alteration based on instantaneous robot-patient interaction and would bring in a possibility of remote sharing with a third party or more in audio-visual mode.

We conclude with a brief glimpse at a couple of emerging developments and promising applications in

this field that are expected to play important roles in the future. Readers should note that this paper is intended to be read mainly by non-roboticists, with little or no background in the field. Specifically, the paper is meant to ignite the interests of conventional health informatics and telemedicine/telehealthcare specialists and clinicians, physiotherapists and rehabilitation professionals into such emerging possibilities. It would also be of interest to experts in robotics who are interested in its potential applications, especially about how robotics may help users in the healthcare and social care sectors. This also my facilitate investments and businesses in the long-term to commercialize use of robotics in health sectors, both in health care centers and in homes.

Conclusion/Recommendations

This trial outcome is highly supportive to the use of robot in rehabilitation of patients. More focus may be needed to improve the friendly interaction and flexible sequence between exercises. Logistic support may be included e.g. refreshment time, rest, short breaks may be considered upon patient request.

There is also a need to address some challenges encountered in the set up. The degree of freedom for all joints was of acceptable level except the pelvic rotation. There is a need to improve on the robustness of the pelvic movement.

The issue of the NAO system getting heated up during the performance causing an interruption in the session needs to be investigated and resolved.

Based on this trial, it is recommended that this work be continued with a larger sample and varying conditions to ensure consistent approach and reliable outcomes.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Attached

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Does Give Malnourished Pregnant Mothers with Supplementary Feeding Biscuit Can affect Pregnancy Outcomes?

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Abstract

Objective: Malnutrition in pregnancy is still problematic in the majority of developing countries. Malnourished pregnant women may result in fetal growth restriction and adverse pregnancy outcomes. This study examined the impact of nutrition intervention in the forms of biscuit on pregnancy outcomes.

Method: This study was an evaluative study on the supplementation program implemented in Pare-pare city, Indonesia. Each package of supplementary feeding biscuit consists of two biscuits (50g) containing 260 kcal of energy, 13g of fat, 8g of protein, 28g of carbs, nine vitamins, and ten minerals. The variables measured were placental weight and diameter, umbilical cord length and Hb, birth weight and length, head circumference, and chest circumference. All measurements were done by trained health workers in the Community Health Service. The analysis of this study was t-test, ANOVA, and regression linear using SPSS v. 24.

Result: The result of the study shows no effect of the biscuit dose on pregnancy Hb, MUAC, and gestational weight among malnourished mother. In comparison between malnourished and healthy mothers, there are no differences in the pregnancy outcomes. The effect of biscuit dose on the outcomes of pregnancy in malnourished mother demonstrated no significant difference among doses given on placental weight and diameter, umbilical cord length and Hb, birth weight and length, head circumference, and chest circumference.

Conclusion: In conclusion, this study demonstrated that given malnourished with a supplementary biscuit will not provide any improvements on the pregnancy outcomes. A clinical trial design study is necessary to examine the beneficial effect of complementary foods.

Keywords: *Pregnancy, complementary feeding, pregnancy outcome.*

Introduction

Malnutrition in pregnancy strongly associated with adverse pregnancy outcomes and can affect the health of the child early in life. Malnutrition is mainly caused by low dietary intake before and during pregnancy influencing the mother's capacity of storing, utilizing, and circulating the nutrients to the fetus[1]. Therefore, maternal nutritional status is the key to supporting fetal growth and development, along with other factors, such as placental, fetal, and genetic factors (Sharma et al., 2016). Women with acute malnutrition are likely to have stunted children compared to healthy pregnant women[2] and this associated with the increase of noncommunicable diseases risk[3]. However, recent reports illustrate that majority of children affected by stunting were in developing countries where the population is predominantly with low socio-economic status and exacerbated by intergenerational effects (short or malnourished mother)[1,4]. Several dietary interventions have been implemented to prevent the negative effect

of nutrient deficiency experienced by many pregnant women, especially in developing countries. However, there was no effect of nutrition interventions on pregnancy outcomes and only a small effect on the reduction in the incidence of preterm birth[5,6]. The result of intervention might be varied accordingly the specific problem in the population. For instance, the population with chronic energy malnutrition may be inappropriately given with micronutrient interventions.

A recent survey in 2018 shows that the number of chronic malnourished pregnant women in Indonesia, defined as mid-upper arm circumference less than 23.5cm, reached 17.3% [7]. In Pare-pare city, located in South Sulawesi, the prevalence of malnourished mother was 23.2% [8].Nutritional status before and during early pregnancy is critical, although the result is inconsistent in terms of its effect on pregnancy and pregnancy outcomes. A prospective cohort shows that maternal BMI was not associated with a gestational weight gain of the mother[9]. However, the limitation of this study was the malnourished participants were small. A systematic review indicated that maternal nutrition is associated with neurocognitive function during childhood, implicating that health pregnancy states may be beneficial in supporting fetal growth and development and child outcomes[10]. Another study shows that the nutritional status of the pregnancy was positively associated with birth weight. Thus, the nutritional status of pregnancy should be improved[11].

In improving maternal nutritional status during pregnancy, many supplementation programs have been implemented. To date, a supplementation of nutrient-rich biscuit, called complementary feeding program or PMT, has been implemented by the government in Pare-pare with an intended to support nutrients for the pregnant mothers and their fetus. However, it is not known yet to what extent the effect of this supplementation program on the pregnancy outcomes, specifically for those with chronic malnutrition. This study aimed to examine the impact of supplementation program given to malnourished pregnant women on the pregnancy outcomes.

Material and Method

This study was an evaluation program observing the pregnancy outcomes of the mother received complementary feeding program in the form of a biscuit. The design of the study has been described in the previous publication[8]. This study has been done in Pare-Pare City, Indonesia.Malnourished mother was defined as the mother with MUAC measurement at enrolment <23.5cm and healthy mother was otherwise. Each package of supplementary food consists of two biscuits (50g) containing 260 kcal of energy, 13g of fat, 8g of protein, 28g of carbs, nine vitamins, and ten minerals (Table 1).

Table 1: Nutrient contents of each biscuit package (50g; 260 kcal)

Nutrients (g or% RDA)	Nutrients (g or% RDA)
Fat (13g)	Vitamin C (50%)
Protein (8g)	Natrium (16%)
Carbohydrate (28g)	Folic acid (50%)
Vitamin A (50%)	Pantothenate acid (55%)
Vitamin D (60%)	Selenium (55%)
Vitamin E (55%)	Fluor (60%)
Vitamin B1 (60%)	Iodine (25%)
Vitamin B2 (55%)	Zinc (25%)
Vitamin B6 (60%)	Iron (25%)
Vitamin B12(60%)	Phosphor (15%)
Vitamin B3 (55%)	Calcium (15%)

The variables measured were placental weight and diameter, umbilical cord length and Hb, birth weight and length, head circumference, and chest circumference. The measurement of the umbilical cord Hb was performed at birth using HemoCue (Hb 201+ systems).Placenta and baby were weighed using baby scale meter provided in Community Health Services. Placental diameter, umbilical cord, head circumference and chest circumference were measured using tape. All measurements were done by trained health workers in the Community Health Service. The analysis of this study was t-test, ANOVA, and regression linear. All data analysis was performed using SPSS v. 24 (IBM Corp.).

Results

The results of the changes of hemoglobin, MUAC, and gestational weight gain of pregnant women after given supplementation have been previously published, but the effect of biscuit dose is still presented. **Table 2** shows no effect of the biscuit dose on pregnancy Hb, MUAC, and gestational weight among malnourished mother.

Table 2: Dose effect of complementary biscuit on Hb, gestational weight, and MUAC changes during pregnancy

Changes (n=49)	Dose			p
	≤ 1 biscuit (n=33)	> 1–2 biscuits (n=13)	≥ 3 biscuits (n=3)	
DHb1 – Hb2	-0,25±1,82	-0,54±1,31	-0,63±0,40	0.776
DHb1 – Hb3	-0,25±1,80	-0,16±1,68	-0,73±1,90	0.865
DHb2 – Hb3	-0,01±1,24	0,38±1,92	-0,10±1,80	0.431
DGestational weight	5,03±1,46	5,00±1,83	5,83±1,89	0.875
DMaternal MUAC	1,84±0,89	1,82±1,00	2,67±1,04	0.297

Table 3 shows the difference in the pregnancy outcomes between malnourished and healthy pregnant women. Between the two groups, there are no differences in the outcomes.

Table 3: Differences of pregnancy outcomes between malnourished and healthy pregnant women

Variables	Malnourished (n=49)	Healthy (n=162)	Total (N=211)	p
Placental weight	541.53±175.01	542.685±187.22	542.42±184.05	0.969
Placental diameter	19.13±2.23	19.41±2.12	19.35±2.14	0.429
Umbilical cord length	43.71±9.70	45.25±8.81	44.89±9.02	0.298
Umbilical cord Hb	13.42±2.87	13.37±2.35	13.38±2.47	0.890
Birth weight	3,033.04±367.47	3,036.17±367.26	3,035.45±366.44	0.958
Birth length	47.74±2.00	47.85±1.69	47.82±1.76	0.700
Birth head circumference	32.74±1.34	32.56±1.72	32.60±1.64	0.518
Birth chest circumference	31.96±1.44	31.80±1.68	31.84±1.62	0.544

The effect of biscuit dose on the outcomes of pregnancy in malnourished mother is demonstrated in **Table 4**. There was no significant difference among doses given on placental weight and diameter, umbilical cord length and Hb, birth weight and length, head circumference, and chest circumference.

Table 4: Dose effect of biscuit supplementation on various outcomes of pregnancy among malnourished women

Variable (n=49)	Biscuit Dose			p
	<1 Biscuit (n=33)	>1–2 Biscuits (n=13)	>2 Biscuit (n=3)	
Placental weight	559.39±200.67	495.77±105.10	543.33±75.06	0.547
Placental diameter	19.52±2.41	18.12±1.58	19.33±1.53	0.119
Umbilical cord length	43.76±10.08	43.92±9.72	42.33±8.02	0.991
Umbilical cord Hb	13.72±2.99	13.12±2.14	11.50±4.35	0.310
Birth weight	3,029.52±406.05	3,053.08±313.38	2,985.00±85.00	0.935
Birth length	47.58±2.28	48.15±1.34	47.68±0.58	0.813
Birth head circumference	32.67±1.25	33.08±1.61	32.00±1.00	0.483
Birth chest circumference	31.89±1.41	32.15±1.48	32.00±2.00	0.877

Discussion

The main finding of this study reveals that there was no difference in terms of pregnancy outcomes of malnourished women by the dose of energy-dense biscuits. The complexity of the metabolic process during pregnancy mainly affects fetal growth and developments, determining pregnancy outcomes. Intrauterine growth retardation (IUGR),one of the common forms of complications during pregnancy,is associated with the oxidative stress caused by exceeding of pregnancy complexity end products, called reactive oxygen species (ROS)[12]. However, to what extent the impact of oxidative stress on the specific outcome of pregnancy is poorly understood. A prospective cohort study shows that oxidative stress biomarker is associated with adverse pregnancy outcomes, although the age of participants of the study was in the risk (>30 years) that probably affect the metabolic process during pregnancy[13].

Most studies correlate oxidative stress during pregnancy to antioxidant-functioned micronutrients, such as iron, copper, zinc, and manganese[14,15].Casanueva and Viteri suggested that iron intake is critical determining balance oxidative stress in thehuman body. A proper dose and timing of iron supplementation potentially cause the reduction of oxidative stress. Conversely, iron overload may induce oxidative stress[15]. In the present study, malnourished participants received iron-folic acid supplementation. This supplementation may correct the nutrient status of the participants, resulting in a positive result in fetal growth which is manifested in pregnancy outcomes. Energy-dense biscuits supplement given to the participants may successfully support the nutrient supply for the mother and fetus and complement the role of iron-folic acid supplement in various metabolic mechanisms during pregnancy. Hence, the dose of the biscuits could not be seen explicitly in this study. This finding is supported by the result in which the outcomes of pregnancy between malnourished and healthy pregnant women were not statistically different. Supported by a previous study[8], it can be assumedthat the nutrients status in the malnourished body, both macro and micronutrients, potentially resemble those healthy pregnant women.

The interesting finding of this study was that the placenta and birth weight outcomes in malnourished women are similar to health pregnancy women. Given that this finding implicates for the potential treatment of minimizing the risk factor of stunting. Low birth weight is one of the determinant factors causing stunting in children under five[16]. Whereas the placenta is the supportive feature for maternal-fetal oxygen transport and nutrient exchange which affects birth weight. Placental weight is the manifestation of fetal growth in utero characterized by many dimensions of growth[17]. One of the dimensions is umbilical cord length. In this study, malnourished women have similar cord length to healthy pregnant women (43.71±9.70 vs 45.25±8.81, p=0.298), indicating that the growth of fetus established. Therefore, it can be fairly stated that the supplementation of biscuit along with iron-folic acid may be effective in reducing the risk of adverse pregnancy outcomes in malnourished women. However, this study did not measure the impact of biscuit supplementation in healthy pregnant women which may reveal other mechanisms involved in metabolic pathways during pregnancy.

The limitation of this study was that the dietary intakes were not observed. Dietary intake can potentially justify the explanation to what extent the contribution of those supplementations to meet the nutrient requirements of malnourished pregnancy. Second, the number of pregnant women who consumedbiscuits as recommended (two biscuits per day) was underestimated (only three mothers). However, since this is a study which was observed nutritional program of the government, it then describedthe real setting that a real challenge in the population. Hence, the government understands which has to be improved in order to support maternal and child health.This study also did not measure the impact of the biscuit supplementation on the healthy pregnancy as the program only be given to those malnourished women. The strength of this study was in the outcomes of the pregnancy measured. Measuring placenta, umbilical cord, and birth weight may give a comprehensive explanation of the supplementation effect during pregnancy.

Conclusion

In conclusion, this study demonstrated that given malnourished with a supplementary biscuit will not provide any improvements on the pregnancy outcomes. The government should review the program of biscuit supplementation in order to improve pregnancy outcomes. Further research is necessary using clinical trial design to examine the beneficial effect of complementary foods.

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Conflict of Interest: All authors declared no conflict of interest within this study.

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Heavy Metals Concentration and Biochemical Parameters in the Blood and Nails of Industrial Workers

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Abstract

This study amied to measure the concentration of heavy metals (Pb, Cd) and certain biochemical variables in blood and nails of(50) samples(male and female) of workers (who were in risk of exposition to these heavy metals) from Northern Gas Company in Kirkuk city/Iraq. Flame atomic absorption spectrometer was used for measuring these elements. The results showed significant differences ($P < 0.01$) in the concentration of lead and cadmium in the studied samples (whole blood and nails) of workers compared to the control group. The concentration of lead and cadmium were higher in blood and Nails. As of the biochemical variables, significant differences ($P < 0.05$) showed in the concentration of antioxidant enzyme (SOD) in serum. As of oxidative stress (MDA), results showed significant differences ($P < 0.05$) in serum, the highest value of (MDA) was recorded in serum samples.

Keywords: *Heavy metals, Antioxidant, Oxidative stress.*

Introduction

Heavy metals have found as natural constituents of the Earth's crust and are non-degradable in nature and tend to form pollutants of living organisms in the environment,[1] and living organisms inhabiting contaminated sites may be exposed to very high amounts of heavy metals as they are toxic and may cause adverse effects, even if in small concentrations.[2-3]

Different sources of heavy metals were found in the environment (natural and industrial). Natural sources such as weathering and volcanic eruption contribute significantly to the pollution of heavy metals,[4-6] and industrial sources such as; mineral processing in refineries, power plants, coal combustion, oil combustion, nuclear power plants, chemical and metal industries, in addition to the plants of wood preservation, and paper processing.[7,8]

Malondialdehyde (MDA), one type of oxidant, is the final product for the oxidation of polyunsaturated fatty acids, which is an indicator for estimating oxidative stress.[9] Antioxidants are of great importance as they are the first line of defence against free radicals, and the need for antioxidants becomes more critical with increasing exposure to free radicals.[10] The human antioxidant defence system consists of enzymatic and non – enzymatic systems. Many enzymatic systems are stimulatingreactions to neutralise free radicals. These enzymes include Superoxide Dismutases (SOD), Catalases (CAT), Glutathione Peroxidases (GPX), Glutathione Reductases (GRX), and these mechanisms form the internal defence mechanisms of the body to help protect against cell damage caused by free radicals.[11] These enzymes also require co-factors such as copper, zinc, and selenium as a stimulant to activate enzymes to maintain functions and prevent oxidation in human cells, and the need for antioxidants has become very important with increased exposure to free radicals.

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Materials and Method

The samples of blood and nails were collected from 50 employees (males and females) aged between 20-65 years of the Northern Gas Company in Kirkuk governorate, while the duration of exposure or years of work ranged between (1-30) years. The control group was selected from 20 people outside the North Gas Company, which did not work in the industrial sector.

The samples were collected in January 2019. The elements were estimated in all studied samples by an atomic absorption device (ASS), where the lead element was measured by the flame atomic absorption device (FAAS), while the Cd element by non-flammable atomic absorption device (GFAAS).[12]

Preparation and Sating Samples:

1. **Blood:** 10 ml of blood was collected from each person; blood samples were divided into two parts; in the first part, (5 ml) was placed in an anticoagulant tube and kept at room temperature to measure lead and cadmium. In the second part, (5 ml) was placed in plastic tubes with tight lids and free from any anticoagulant (Plain tube), and was left at room temperature (25 C) until coagulated, and then placed in the centrifuge for 10 minutes at a speed of 3000 rpm, afterword serum was collected by micropipette to measure biochemical tests. It was then transferred to dry plastic tubes and kept at 10° C using Deep Freezer [13] until tests were carried out. The concentration of lead and cadmium in the blood of the workers was estimated by Haswell method.[13]
2. **Nails:** Each person's nails were trimmed with clean, sterile scissors, and then placed in sealed plastic bags. Nails were then washed with non-ionic cleaners. After a standard wash, the nail samples were soaked in acetone. Finally, the samples are rinsed five times with deionised water and then dried in the oven at 110 c̊ and stored in the desiccant pending analysis. The samples were divided into two parts, the first part for measuring the heavy elements and the second part for measuring the biochemical variables. The heavy elements in the nail samples were estimated, according to Abdul-Rahman et al.[14] method.

Statistical analysis: Results were statistically analysed using ANOVA test and the results obtained were described in the tables as (mean and standard deviation) and with a probability level (P <0.05) and P <0.01).

Results and Discussion

1. **Heavy Metals:**

Estimation of heavy metals in whole blood:

Lead-(Pb): The results of table (1) showed different concentrations of the lead element; the concentration of the lead in whole blood of workers during the study period was (25.40 ± 4.20) and control (13.91 ± 2.02), respectively (Figure 1). Statistically significant differences were found (P<0.01) between the concentration of the lead in the whole blood of workers and the control group, that it was found to be higher than the control group. The reason for the high concentration of lead in the workers could be attributed to the tetraethyl lead, chemicals that emitted from North Gas Company. Furthermore, a study has shown that high concentrations of lead in industrial atmospheres are humanmade, as it is almost 100 times higher in industrial atmospheres compared to natural atmospheres [15]. Increasing the concentration of lead in the whole blood leads to many adverse consequences such as hypertension, renal failure, and brain damage.[16] These findings are consistent with those reported by others [17, 18].

Table (1): Concentration of heavy metals ($Pb_{\mu g/dl}$, $Cd_{\mu g/dl}$) inworkers' whole blood and control group

Elements	Groups	Mean±SD	P-Value
Pb	Workers	25.40±4.20	P<0.01
	Control	13.91±2.02	
Cd	Workers	1.0904±0.0416	P<0.01
	Control	0.2782±0.0291	

Cadmium-(Cd): The results of table (1) showed different concentrations of the Cadmium; the concentration of the Cadmium in whole blood of workers during the study period was (1.0904±0.0416) and control group (0.2782±0.0291), respectively (Figure 1). Statistically significant differences were found (P<0.01) between the concentration of the lead in the whole blood of workers and the control group, that it was found to be higher than the control group. The high concentration of cadmium in workers was attributed to industrial emissions, especially the mining and mineral refining industry. Also, cadmium occurs naturally with zinc and lead in sulfide ores. Cadmium has a direct relationship with some chronic diseases, such as hypertension, which is an excellent indicator of exposure to cadmium in occupationally exposed individuals.Cadmium leads to an increase in systolic and diastolic blood pressure, and thus an increase in high blood pressure.[19]

The results obtained were mostly consistent with studies conducted on gas station workers in Babil[17] and Basrah[18] governorates, where there was a decrease in the concentration of (Cu, Zn, Mg) and an increase in the concentration of (Cd, Pb) in the blood of gas station workers compared to the control group.

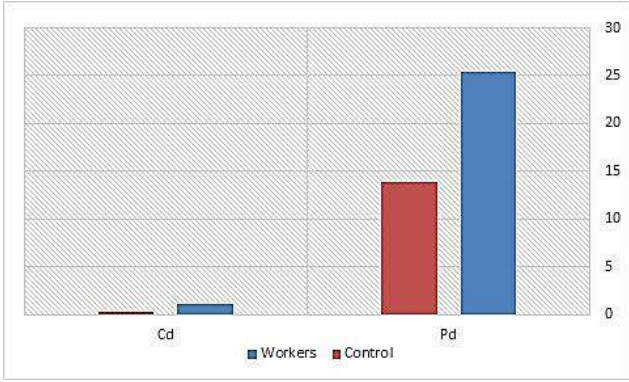

Figure 1: Concentration of Heavy Metals ($Pb_{\mu g/dl}$, $Cd_{\mu g/dl}$) in workers' Whole Blood and control group

Estimation of heavy metals in workers' hair compared to the control group

Table (2): Concentration of heavy metals ($Pb_{\mu g/dl}$, $Cd_{\mu g/dl}$) in workers' hair and control group.

Elements	Groups	Mean±SD	P-Value
Pb	Workers Control	15.70±2.18 7.75±1.29	P<0.01
Cd	Workers Control	0.1330±0.0264 0.0820±0.0194	P<0.01

Lead-(Pb): The lead element poses a real concern among heavy metals because of its toxicity, and there is no primary function in the human body, the damage can occur only after its absorption from air or water [20].

The results of table (2) showed different concentrations of the lead element; the concentration of the lead in whole blood of workers during the study period was (15.70±2.18) and control (7.75±1.29), respectively (Figure 2).

Estimation of heavy metals in workers' nailcompared to the control group:

Table (3): Concentration of heavy metals ($Pb_{\mu g/dl}$, $Cd_{\mu g/dl}$) in workers' nail and control group

Elements	Groups	Mean±SD	P-Value
Pb	Workers Control	14.57±2.50 9.11±1.60	P<0.01
Cd	Workers Control	0.1362±0.0217 0.0925±0.0189	P<0.01

Lead-(Pb): The results obtained, shown in Table (3), indicate the concentration of the lead element in workers' nails compared to the control group, where the concentration of lead in workers' nails was 14.57 ± 2.50), and in the control group (9.11 ± 1.60), (Figure 3). Statistically, there were significant differences (P <0.01) for the average concentration of lead in workers' nails compared to the control group.This is due to occupational exposure, which contributes to the absorption of minerals, and these results are like those reported by others.[21, 22]

Cadmium-(Cd): The results obtained, shown in Table (3), showed the concentration of cadmium in workers 'nails compared with the control group, where the concentration of cadmium in workers' nails was 0.1362 ± 0.0217), and in the control group (0.0925 ± 0.0189), (Figure 2).Statistically, there were significant differences (P <0.01) on the average concentration of cadmium in workers' nails compared to the control group. The reason for the high concentration of cadmium is due to the complex occupational exposure of the elements, and the results obtained are consistent with the findings.[21, 22]

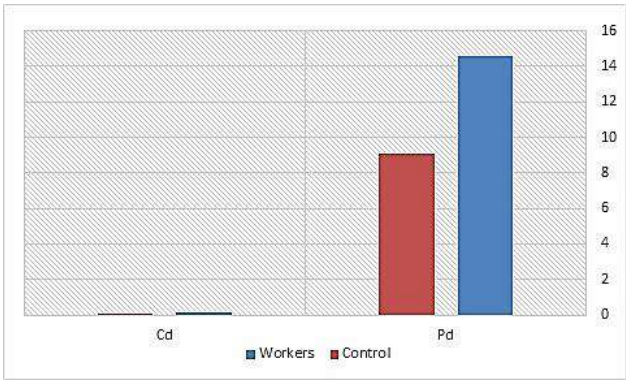

Figure 2. The concentration of heavy metals ($Pb_{\mu g/dl}$, $Cd_{\mu g/dl}$) in workers' nail and control group.

Biochemical Variables:

Estimation of oxidative and antioxidant concentrations in blood serum:

Table (4): Concentration of Enzymes (SOD $_{U/ML}$, MDA $_{\mu mol/L}$) in the blood serum of workers and control group

Variables	Groups	Mean±SD	P-Value
SOD	Workers Control	30.7±3.1 49.3±10.5	P<0.05
MDA	Workers Control	123.6±16.9 70.0±13.7	P<0.05

The concentration of Superoxide dismutase (SOD) enzyme: The results of table (4) show the concentration of enzyme (SOD) in the serum of workers and the control

group, where the concentration of enzyme in the serum of workers was (30.7 ± 3.1) which was lower than the control group was (49.3 ± 10.5),(Figure 4).Statistically, there were significant differences between the workers and the control group ($p < 0.05$). The reason for the decrease in the concentration of the enzyme SOD is that it is common in contaminated environments because this enzyme is necessary to protect the body's cells from free radicals and excessive oxygen that promote ageing or cell death.[23] Moreover, trace elements (Zn, Cu, Mg) are SOD components and are associated with antioxidant functions, so their deficiency may lead to poor control of free radicals, and all these elements are replaced by lead, which reduces the activity of (SOD).[24] The results obtained were in contrast with that reported in another study [25] and coincide with the others.[17, 18, 26, 27]

Concentration Serum lipid peroxidation (MDA): The results are shown in Table (4) indicate that the concentration of MDA in the serum of the workers (123.6 ± 16.9) was high in comparison to the control group (70.0 ± 13.7),(Figure 4). Statistically, there were significant differences between the workers and the control group ($p<0.05$). The reason for this is that the rise in the level of heavy metals leads to the destruction of oxidative stress by increasing the production of free radicals (ROS), which reduces the system of antioxidant defence in cells and increase the concentration MDA.[28,29] These results are consistent with other findings.[17,18,26,30]

Figure 4: The concentration of Enzymes (SOD $_{U/ML}$, MDA $_{\mu mol/L}$) in the blood serum of workers and control group

Conclusion

The results of this study concluded that the concentration of heavy metals (Pb, Cd) was high in the whole blood and nails of the workers in the North Gas Company. Moreover, the concentration of SOD enzyme in the blood and samples was low;the MDA was high in all samples of studied workers.

Conflict of Interest: None of the authors have any conflicts of interest to declare.

Source of Funding: The research was performed independently, there is no funding

Ethical Clearance: The project was approved by the local ethical committee in University of Kirkuk.

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Impact of Workplace Violence Educational Program on Self-Confidence for Nursing Staff Working in Psychiatric Hospital

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Abstract

Inpatient mental health clinicians need to feel safe in the workplace. They require confidence in their ability to work with aggressive patients, allowing the provision of therapeutic care while protecting themselves and other patients from psychological and physical harm. **The aim** of this study is to evaluate the impact of educational training program on self- confidence for nursing staff working in psychiatric hospital. **Design**: A quasi-experimental design" pre-posttest assessment" was utilized for the current study. A sample of convenience of 45 psychiatric nurses who agree to participate and were in Al-Abbassia mental health hospital were included. **Two tools** were utilized in the current study including Socio- Demographic including Department Data Sheet, Confidence in Managing Service user Aggression. **The results** showed that: there was a highly statistically significant difference was found for all items in nurses' pre versus post self- confidence assessment. Also there was a positive significant correlation between nurses' level of self-confidence and the frequency of isolation for the patients & nurses' years of experience in pre & post assessment, while there is no significance correlation between nurses' level of self-confidence and their age, gender, or duration of patient's isolation. **To conclude that**, nurses who received the educational training program about workplace violence showed higher score in their post assessment of self- confidence than before receiving the program. So the research hypotheses was accepted. Further studies was **recommended** in addressing the effect of training on staff behavior to be measured through direct observation.

Keywords: *Workplace Violence, self-confidence, Psychiatric Nursing Staff.*

Introduction

Workplace violence (WPV) toward nurses working in the hospital environment is a well-known issue worldwide. It compromises not only health care professionals' physical well-being but also their psychological well-being. The victims may suffer physical and mental stress and a high degree of anxiety, nurses are one of the professional groups most exposed to physical aggression, verbal abuse, and threats because nurses have more frequent and longer contacts with patients or families and are responsible for providing direct care.[1]

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According to[2], professional quality of life reflects how individuals feel about their work as helpers. A crucial factor in improving the delivery of service to patients in acute care psychiatric units appears to be the confidence level of staff to deal with aggression both in the antecedent stages and when physical aggression occurs.

[2]added that,a crucial factor in improving the delivery of service to patients in acute care psychiatric units appears to be the confidence level of staff to deal with aggression both in the antecedent stages and when physical aggression occurs. There are many factors that impacted on clinicians' confidence to manage aggression as colleagues' knowledge, experience and skill, management of aggression, use of prevention and intervention strategies, teamwork and the staff profile.

Subject and Method

Aim of the study: The current study is to evaluate

the impact of educational training program on self-confidence for nursing staff working in psychiatric hospital.

Research Hypothesis: Nurses who will receive the educational training program about workplace violence will show higher score in their post assessment of self-confidence than before receiving the program.

Sample: A sample of convenience of 45 psychiatric nurses who agree to participate and were in Al-Abbassia mental health hospital were included.

Tools of Data Collection:

1. **Socio-Demographic & Department Data Sheet:** It was developed by the researcher. It was divided into two parts, first part was about nursing staff Scio-demographics included gender, education level, and years of experience etc.... The second part was about the department's data such as department type (in-patient or out- patient), the approximate number & duration of using seclusion & or restraints in the section per year etc....
2. **Confidence in Managing Service user Aggression:** The questionnaire was developed by[3] & was selected as suitable for measuring confidence in coping with patient aggression. But it was modified & adopted from[4] to assess nurse's self- confidence in managing service user aggression and their ability to deal with violent situations. It consists of a 7 items rating scale ranged from (1-7) and one qualitative (open ended question). In the rating scale, respondents were asked to indicate their degree of confidence to the questions using a 7 point rating scale with verbal descriptors at each end, e.g. 7 = very sure/very able/ very save, and 1 = very unsure/very unable/safe. Respondents were asked to circle the number 7 at the upper end of the scale if their response to a question was very positive, or the number 1 if their response was very negative. If the response was somewhat positive respondents were asked to circle 5 or 6 and if they was somewhat negative to circle 2 or 3. Where they were unsure or undecided they were asked to circle the number 4.

Procedure:

1. **Obtaining required tools and designing the program:** A review of related literatures was done using available books, articles, and journals, to cover various aspects of nurse's self-confidence in managing aggressive patients and their relatives, and also to obtain the relevant standardized tools and to develop workplace violence prevention program.
2. **Recruitment and interviewing:** An official permission from the research ethics committee in the faculty of nursing was obtained upon the feasibility of the research tools and study. There searcher met with the responsible about training department at El Abbassia Mental Health Hospital after receiving the permeation from the hospital manager in order to recruit staff nurses for participation in the study according to inclusion criteria. Written informed consents were obtained from each participant after complete description of the purpose and nature of the study, all participants were assured and informed that participation in the study is voluntary.
3. **Intervention:** Figure (1), represents the researcher's own interpretation about the information map and skills that each member of the nursing staff must have and mastering in order to enabling them limiting, intervening & managing the in -patient's aggression continuum.

Preventive Strategies

- Awareness & understanding
- Self- awareness
- Assertiveness training

Anticipatory Strategies

- Warning Signs
- Violence assessment
- De-escalation Strategies
- Communication Strategies
- Behavioral actions

Containment Strategies

- Escaping from Holds & Grabs
- Seclusion
- Restraints
- Reporting & Recording

4. **Evaluation:** All participants recruited in the study who receive the program were evaluated for the benefits of the workplace violence prevention program by using the study tools.

Ethical consideration: Written informed consent was taken from each participant who was willing to participate in the research. All participants were informed that, participation in the research is voluntary and any one can withdraw from this study at any time without giving any reason. Confidentiality of the participants were assured through coding the data; a unique identifying number was assigned to the data collected for each participant. Only the researcher had access to these information in the database.

Pilot Study: A pilot study was conducted at the beginning of the study. It included 5 psychiatric nurses. The designed tools were tested on those subjects who were three male and 2 female staff nurses.

Statistical Analysis: Data were analyzed using Statistical Package for Social Sciences (SPSS) version 20. Numerical data were expressed as a mean and standard deviation. Qualitative data were expressed as frequency and percentage. Probability (p-value)> 0.05 indicates non-significant result, p-value< 0.05 is considered a significant result and p-value <0.001 is considered highly significant result.

Results

Table (1) shows that, more than half of nurses (53.3%) were male. More than two thirds (62.2%) were aged from 19<30 years old with mean age (X 30.18±9.1 years). As for years of experience, 46.7% of them have experience 10<25 years with a mean =9.6±8.8 while 22.2% have less than 10 years of experience.

Table (2) shows that, regarding to frequency of using isolation within a year 53.3% of nurses reported that it was ranged from once to less than 20 time/year with mean 16.1±13.4, Regarding to isolation duration, 71.1% of nurses mentioned that it was from one to less than 6 hours with mean 3.5±3.7.

Table (3) revealed that it was a highly statistically significant difference was found for all items in nurses' pre versus post self- confidence assessment (p<0.0001) except for question 7 (p>0.05)

Table (4) showed that there was a positive significant correlation between nurses' level of self-confidence and years of experience & the frequency of isolation for the patients in pre & post assessment .While there is no significance correlation between nurses' level of self-confidence and their age, gender, or duration of patient's isolation.

Table 1: Socio-demographic characteristics of the study sample (n = 45)

Items	No.	Percent	Range/Mean±SD
Gender			
• Male	24	53.3%	
• Female	21	46.7%	
Age			
• 19<30	28	62.2%	
• 30<45	10	22.2%	30.18±9.1
• 45-60	7	15.6%	
Years of Experience			
• 0<10	10	22.2%	
• 10<25	21	46.7%	9.6±8.8
• ≥25	14	31.1%	

Table 2:Work place information of the study sample (n = 45)

Items	No.	Percent	Range/Mean±SD
Duration of Patient's Stay (Month)			
• Zero for out patient	4	8.9%	1.3±0.79
• 1<6	28	62.2%	
• 6<12	8	17.8%	
• ≥12	5	11.1%	
Frequency of Using Isolation within a Year			
• No time	4	8.9%	16.1±13.4
• 1<20	24	53.3%	
• 21<40	12	26.7%	
• ≥40	5	11.1	
Duration of Isolation			
• Zero time	4	8.9%	3.5±3.7
• 1<6	32	71.1%	
• 6<12	8	17.8%	
• 12-24	1	2.2	
• >24	0	0.0%	

Table 3: Nurses' pre versus post self- confidance assessment regarding managing aggressive patients (n = 45)

Items	Mean±SD	t	p
1. How confident are you in your work with hostile and aggressive service users?	1.4±1.5	6.24	0.000**
2. How safe do you feel around aggressive and aggressive service users?	0.3±1.4	1.26	0.215
3. How able are you to de-escalate an aggressive service user?	1.5±1.4	7.26	0.000**
4. How able are you to contribute to the restraint of an aggressive service user?	1.1±1.5	4.93	0.000**
5. How able are you to maintain your own safety in the presence of an aggressive service user?	1.2±1.5	5.42	0.000**
6. How confident are you in the ability of your colleagues' ability to maintain your safety and manage an aggressive service users?	0.8±1.0	5.36	0.000**
7. How safe do you feel the environment in El Abbasiamental health hospital?	0.3±1.6	1.37	0.179

** Highly statistically significant difference at p<0.0001

Table 4: correlation analysis of nurses' self confedance assessment and the sociodemografic data (n= 45)

	Pre		Post	
	r	p	r	p
Age	0.13	0.36	0.06	0.72
Gender	0.10	0.51	0.06	0.72
Years of experience	0.18	0.24	0.33	0.03*
Frequency of isolation	0.33	0.03*	0.31	0.04*
Duration of isolation	0..22	0.15	0.07	0.64

Discussion

The findings of the current study showed a highly significant improvement for all items in nurses' pre versus post self-confidence assessment. And it's also clear that there was an increase in the total weighted mean of the scale in post assessment than the pre. On the same line[5] concluded that there was an overall increase in the nurses' confidence in post assessment.

The greatest area of improvement was in question three "how able are you to de-escalate an aggressive user?" followed by question one "how confident are you in your work with hostile and aggressive service users?" this results are in congruent with[6] who stated that verbal de-escalation training improves confidence of all participants after they provided the training program.

From the researcher's own point of view the overall improvement in the staff confidence is open to at least two interpretations. First, the course specifically focused on teaching staff strategies to deal with aggressive behavior in a more confident manner and directly focused on staff fears when managing challenging behaviors. Second, this particular form of staff training may have a relatively specific effect on staff confidence because prior to this experience, the majority of these participants had not received a theoretical content about how to interact with aggressive patients confidently many years ago.

The current result revealed that, there is no significance correlation between nurses' level of self-confidence and their age, gender, or duration of patient's isolation. This not in the same line with [7]who stated that nurses those are older, had more self-confidence as compared to others.

Furthermore, there was a positive significant correlation between nurses' level of self-confidence and there years of experience & the frequency of isolation. This is not in the same line with [7]who concluded that there was no significant correlation between the lengths of mental health practice with any of the confidence ratings. This was in congruent with [8] who added that, age maturity and increase numbers of years of experience are important in development of assertiveness and as regard development of self-confidence, because the old nurses had ability to solve problem and negotiate work situations.

Conclusion

Nurses who received the educational training program about workplace violence showed higher score in their post assessment of self- confidence than before receiving the program.So the research hypotheses was accepted.

Recommendations:

1. Variables that mediate staff confidence, such as staff fear and anger may be useful to consider infuture studies.
2. The effect of training on staff behavior measured through direct observation should also be addressed.

Source of Funding: Self-funding.

Conflict of Interest: The authors declare that there is no conflict of interest.

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The Association of Glutathion Peroxydase-1 Serum and Sensorineural Hearing Lossin MDR TB Patients with Kanamycin Therapy

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Abstract

Introduction: Kanamycin therapy in Multi-Drug Resistance Tuberculosis (MDR-TB) patients increases the possibility of sensorineural hearing loss through increasing the level of Reactive Oxygen Species (ROS) production in cochlea, particularly in hair cells. In normal state, ROS is detoxicated by numerous antioxidant enzymes, including glutathione peroksidase-1 (GPx-1). Imbalance of antioxidant enzymes and ROS production leads to death of hair cells and eventually sensorineural hearing loss.

Objective: This study aimed to observe the association of GPx-1 level and sensorineural hearing loss in MDR-TB patients with Kanamycin therapy.

Method: This study was a prospective observational study conducted at Dr. Hasan Sadikin General Hospital, Bandung, Indonesia, between February to April 2017. 17 patients were included into the study with pre- and post-kanamycin therapy examination within 3 weeks duration using pure tone audiometry and serum level of GPx-1. Statistic analysis was done using Man Whitney test with significant level of $p < 0.05$.

Result: A significant reduction of GPx-1 level in 3 weeks period after the initial Kanamycin administration was found in the study; $p < 0.001$. Furthermore, there was a significant alteration in the hearing threshold on frequency of 500-800 Hz after Kanamycin administration; $p < 0.05$. There was a significant association between GPx-1 level and sensorineural hearing loss in Kanamycin therapy; $p < 0.05$.

Conclusion: Sensorineural hearing loss in patient with history of Kanamycin therapy was associated with level of GPx-1 degradation.

Keywords: *GPx-1, Kanamycin, MDR TB, Sensorineural hearing loss.*

Introduction

Tuberculosis (TB) remains a concern among global health problem with a high mortality and morbidity rate.[1] WHO also stated that Indonesia had approximately 6,800 new Multi Drug Resistance TB (MDR TB) annually with approximately 2% of new cases and 12% of re-treatment TB were MDR TB.[2,3,4] Among all injection drugs for MDR TB, Kanamycin is widely used as stated in WHO's recent MDR TB guideline due to its wide distribution area and affordable price.[5,6,7,8]

In general, three types of antioxidant present in human body.[14] Among all GPx, Glutathione peroxide-1 (GPx-1) is the main glutathione peroxide enzyme family; mainly found in erythrocyte, liver, lungs, kidney, and almost in all cells' organ (cytosol, mitochondria, and peroxisome).[15,16] Furthermore, in cochlea, GPx-1 has a higher enzymatic activity in organ of corti, spiral ganglion, stria vascularis, spiral ligament, and another supporting cell.[17,18,19] Higher activity of SOD and CAT are also found in stria vascularis and organ of corti. GSH and GPx are the main antioxidants in those areas.[14]

Study conducted by Alli, et al. in 2014 on 83 MDR TB patients showed that there was a significant degradation of antioxidant enzyme activity, including glutathione transferase and glutathione peroxide.[20] It was strengthened by Madebo et al who also showed a significant decrease in glutathione peroxide level in TB MDR patients.[20,22]

Rakhmawati in her study found sensorineural hearing loss, particularly in high frequencies, 4000-8000 Hz, in MDR TB patient treated using Kanamycin within the 19th to 22nd day of therapy, affecting high frequency hearing ability to lower frequency.[8] Study conducted by Jiang et al in 2006 found that there was a shift in auditory brain stem response (ABR) by 45-50 dB in the 14th day that was remained for 5 weeks also showed that the death of hair cells happened in the 11th day and 30% of the superficial hair cells died after 14 days.[24] It is proposed that hearing loss due to Kanamycin's toxicity mostly started on higher frequency tone as it is located on the basal of cochlea; this progressivity happens due to difference of survival ability among the hair cells on basal and apex cochlea; as explained by the lower level of GPx-1 in basal hair cell in comparison with apex of cochlea.[25]

This study aims to observe the association between GPx-1 level and SNHL in MDR TB patients treated using Kanamycin.

Material and Method

This study was an analytic prospective observational study with pre- and post- intervention examination for association between variables, which had been ethically legalized before. **Participants.** Patients with MDR TB at MDR TB Policlinic of Internal Medicine Department of Dr. Hasan Sadikin General Hospital, Bandung between February to April 2017. The inclusion criteria for the study were patients with MDR TB with plan for Kanamycin therapy, aged 20-50 years old, had intact tympanic membrane in both ears, had type A result on tympanometry examination, normal hearing threshold on DPOAE examination and audiometry. Exclusion criteria for the study were patient with history of treatment using ototoxic drugs except TB-MDR treatment, had a history of another diseases, including renal failure, diabetes mellitus, liver diseases, systemic lupus erythematosus (SLE), and cardiovascular diseases. **Intervention**. Data was collected from physical examination and laboratories data of already diagnosed MDR TB patients and planned for kanamycin therapy. Data before and 3 weeks after treatment consist of personal data collection, physical exam of ENT, tympanometry, pure tone audiometry, DPOAE, and blood sample collection for glutation peroksidase-1 (GPx-1) serum. **Outcome.**The data then analyzed for comparison of subject group characteristic using paired t-test if the data is normally distribute, and using Wilcoxon if the data is abnormally distribute. The data is also analyzed for GPx-1 level correlation with SNHL using Mann-Whitney test. The result is statistically significant if p≤0,05.

Findings: This study was held from February 2017 to April 2017, using 17 subject that fulfill the inclusion criteria. All subject received same test for pre and post Kanamycin therapy, which includes tympanometry, pure tone audiometry, DPOAE, and GPx-1 level.

Table 1: Subject Characteristic

Characteristics	**n=17**
Gender, n (%)	
Male	7 (41,2)
Female	10 (58,8)
Age (Years)	
Mean ± SD	36 ± 8
Range	23 – 46

Table 2. GPx-1 Level Before and After Kanamycin Therapy

	Measurement		**Decendants (%)**	**p-value**
	Before therapy (u/l)	**After 3 weeks therapy (u/l)**		
GPx-1				
Mean ± SD	4,49 ± 3,12	1,2 ± 1,0	70.42 ± 20,94	<0,001*
Range	1,01 – 14,01	0,07 – 5,15	18.81 – 98,54	

Analysis using paired-t test. *significant if p ≤ 0.05

Based on these table GPx-1 level before therapy with range 1,01-14,01 (4,49 ± 3,12) and GPx-1 level after therapy (1,2 ± 1,0) with range 0,07 – 5,15.

Table 3. Correlation between GPx-1 level and DPOAE value

	DPOAE test (Dp-NF)		p-value
	Pass n=4 (23,5%)	Refer n=13 (76,5%)	
GPx-1			
Mean ± SD	66,60 ± 21,02	84,59 ± 14,86	0,062*
Range	18,81 – 92,36	64,40 – 98,54	

Analysis using paired-t test. *significant if $p \leq 0.05$

From the analysis above, GPx-1 median value at ear that having DPOAE test a "refer" value is higher (84,59 ± 14,86) compared to those who have DPOAE test a "pass" value (66,60 ±21,02), but it's not significant statistically (p=0,062).

Table 4. Audiometry examination before and after Kanamycin therapy

Frequency	Ear	Threshold (dB)		p-value
		Before Therapy Mean ± SD	After Therapy Mean ± SD	
500 Hz	AD	20,6 ± 5,6	23,7 ± 5,3	0,002
	AS	21,2 ± 4,5	24,7 ± 4,1	0,020
1.000 Hz	AD	18,8 ± 3,3	19,4 ± 5,0	0,041
	AS	18,2 ± 5,0	21,8 ± 3,5	0,048
2.000 Hz	AD	14,4 ± 3,6	17,7 ± 3,3	0,045
	AS	14,4 ± 3,9	18,5 ± 5,8	0,016
4.000 Hz	AD	16,8 ± 5,6	20,9 ± 4,4	0,050
	AS	15,3 ± 6,0	21,8 ± 6,4	0,020
8.000 Hz	AD	19,1 ± 7,3	24,4 ± 6,6	0,003
	AS	18,0 ± 7,7	25,9 ± 10,3	0,004

Analysis using paired-t test. *significant if $p \leq 0.05$

There's a significant increase in hearing threshold on both ear from pre to post Kanamycin therapy using audiometry each frequency.

Table 5. Correlation between GPx-1 Level and Sensorineural Hearing Loss

	SNHL		P value
	Yes n=13 (76,5%)	No n=4 (23,5%)	
GPx-1 Pre Therapy			
Mean ± SD	3,68 ± 1,99	7,13 ± 4,88	
Median	3,73	5,88	0,049
Range	1,01 – 6,32	2,75 – 14,01	
GPx-1 Post Therapy			
Mean ± SD	0,95 ± 0,71	1,99 ± 2,17	
Median	0,82	1,30	0,013
Range	0,07 – 2,59	0,21 – 5,15	

Analysis using Mann-Whitney test. *significant if $p \leq 0.05$

There's a significant correlation between GPx-1 level and SNHL condition.

Discussions

This study conclude MDR TB is mostly suffered by female (58.2%) compared with male (41,8%). Liu et.al hypothesized that female mostly spend their day taking care of their family who has MDR TB, compared to male, so the risk of bacterial infection transmission is higher in female.[28] This result also found in Pelaquin et.al study and WHO data survey on 2015.[2,29] Pelaquin study stated that gender does not affect the ototoxic effect of Kanamycin in MDR TB therapy and there is no direct correlation between MDR TB incidence and gender.[29]

Based on age group, this study conclude that MDR TB cases occur mostly on productive age (23 – 46 years old). This result was supported by Rakhmawati and Reviono et.al study that also found that MDR TB cases most likely occur on age 20 – 50 years.[7,8] Medical record data at Dr. Hasan Sadikin General Hospital, Bandung, Indonesia on 2016 stated that MDR TB mostly happen in age group 25-54 years.[4] Productive age have higher working time than other age group, which may affect the obedience for taking medicine, which then lead to drug resistance. Productive age also has more contact to different people in work, school, or other activity, so the risk of bacterial transmission is higher and could influence the incidence of MDR TB.[28]

Kanamycin is known for its side effect damaging outer hair cell of cochlea. This study used DPOAE on frequency ranged 1,500 Hz to 8,000 Hz which was tested prior and 3 weeks after the therapy begin. The result was most of the study subject exhibit "refer" value, which indicates damage at cochlear cell hair. Other study by Mustikaningtyas also exhibit the same result.[25,30] DPOAE test could provide initial data of hearing condition and early detection of ototoxicity. Reavis et.al stated that DPOAE could detect around 78% of hearing problem cases, which then confirmed using HFA. Other study also stated that DPOAE test is sensitive in monitoring of ototoxicity caused by drugs.[28]

MDR TB infection is a chronic infection, marked by a decrease in one of antioxidant enzyme. Study of Alli et.al and Madebo stated that the antioxidant enzyme known to be decreased by chronic infection is GPx-1.[16,17] This study found that GPx-1 level is significantly decrease after 3 weeks therapy of Kanamycin. ROS production happens continuously inside the cell, together with a decrease in antioxidant production, which results an imbalance level of antioxidant and ROS. This imbalance leads to DNA, cell membrane, cell protein and kinase protein damage. DNA damage can be repaired by Base Excision Repair (BER) mechanism, but if the damage exceeded BER capability, the cell will activate protein P53 and result in apoptosis.[27] GPx-1 level is determined by many factor, such as inflammation process, inadequate nutritional intake, and low social economy condition.[20]

Pure tone audiometry testing is used to monitor the change of hearing threshold due to Kanamycin therapy. A study conducted by Rakhmawati also shows a decrease on sensorineural hearing function from frequency 4.000 Hz to 8.000 Hz.[7] Other study conducted by Mustikaningtyas shows that SNHL after Kanamycin therapy happens in several level (48% mild, 24% moderate, 4% moderate-severe, 1% severe and 15% very severe).[30]

Baseline data, consist of HFA, tympanometry, speech audiometry, and OAE, should be recorded before administration of ototoxic therapy to determine the hearing threshold. Pure tone audiometry is the only exam that still used before administering ototoxic therapy.[26]

Early stage of Kanamycin therapy does not exhibit hearing problem on speech frequency (500 – 4.000 Hz), so not many patient realized that hearing problem is already happened. HFA exam can be useful for early detection of hearing problem, so further and more severe condition can be prevented.[14]

Table 3 showed a tendency of diminishing level of GPx-1 level after Kanamycin therapy, although it is not statistically significant. This may result from a minimal number of samples. On this study, decreasing level of GPx-1 level is more likely to be lower on "refer" value ear compared to "pass" value ear after therapy, whereas GPx-1 level is higher on "refer" value ear compared to "pass" value ear before therapy. This may result from higher exposure of ROS on "refer" value ear cochlea as an effect of intracellular defense, which then lead to an increase in GPx-1 level at the beginning to balance ROS level. This mechanism will end at some point due to maximal compensatory effect of GPx-1 enzyme, so the imbalance of ROS and antioxidant enzyme is no more tolerable, which lead to the damage of cochlear hair cell.[14,23]

Table 5 shows that GPx-1 level is significantly related to SNHL. Low GPx-1 level decreasing the capability of this enzyme to eliminate ROS, especially in basal area of cochlea.[31] This phenomenon is because GPx-1 level in basal area of cochlea is lower than in

apex area, causing basal area to be more vulnerable.[15] Study conducted by Sharma et.al showed that 18 MDR TB patient that is given Kanamycin therapy for 6 weeks, develop sensorineural hearing problem, 2% on the first week and 12% after 6th week. Mostly having bilateral hearing problem.[25]

The limitations of this study were the fact that GPx-1 examination performed with ELISA which only saw serum levels or amount of the enzyme, but not the activity of the enzyme.

Conclusion

There is a significant correlation between GPx-1 level and SNHL condition proceeding Kanamycin therapy on MDR TB patient, characterized by a decrease in GPx-1 level and an increase in hearing threshold on subjects after administration of Kanamycin therapy.

Conflict of Interest: There was no conflict of interest in this study.

Ethical Clearance: The ethical clearance is granted from KEPK, Dr Hasan Sadikin General Hospital, Bandung no.LB.04.01/A05/EC/033/II/2017.

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Post-Traumatic Growth with Police Officer: System Review (Focused on Korean and Foreign Studies)

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Abstract

Purpose: The purpose of this study was to analyze literature related to post-traumatic growth with police officer. Method: Systematic review of studies published were conducted through a vatiety of databases such as Ovid-Embase, Ovid-Medline, The cochrane library, Pubmed, RISS. The research terms included Police officers, Police, Trauma, Posttraumatic growth, Growth. Results: All studies were correlation analysis. In the Korean researches, PTG was positively correlated with self-esteem, problem focused coping, emotion focused coping, social support, self-disclosure and deliberate rumination. In the foreign researches, PTG was correlated with thriving, resilience, events involving threat, personal relationship stress, trauma severity, life stress, and gratitude. Demographic variables such as Female, White were also associated with PTG. Conclusion: To improve post-traumatic growth of police officers, strategies to increase stress coping, social support, are needed. Strategies to decrease stress, trauma and PTSD symptoms should be developed.

Keywords: *Police officers, Police, Post-traumatic, Growth, Review literature as topic.*

Introduction

The increases in crime and violence in Korea may have a great impact on the life and safety of police officers, and according to the statistics of the National Police Agency, of 9,552 on-duty-injured people for the last five years, the assaulted injuries, traffic accidents, and negligent accidents accounted for 97% of the total number of on-duty-injured people.[1] Particularly, these traumatic events will be directly linked not only to the police officers' lives but also to the protection for the lives of the people. In DSM-IV (1994) of the American Psychiatric Association, the trauma cases were extended to direct or indirect experiences that may threaten physical well-being, including life threats, serious injuries, striking events and so on.[2]The experiences of various traumatic events, such as witnessing of the murder scene, usage of guns, and violence during the suppression process, which should be undergone on duty, cause the anxiety, pain, and trauma to the relevant event. These various traumatic experiences lead to Posttraumatic Stress Disorder (PTSD).

Accordingly, in the meantime, the studies on post-traumatic stress have been actively conducted, which have focused on negative physical and psychological experiences and symptoms, accompanied by traumatic events, such as depression, anxiety.[3] However, not all people will be led to the post-traumatic stress after experiencing traumatic events, and even if they experience the same trauma, most people will overcome it well, sometimes experiencing physical and mental growth.[4] In other words, they may experience positive psychological changes that would be perceived after the traumatic event or crisis, and such changes are called as the posttraumatic growth (PTG).[5] The positive psychological change, mentioned here, may mean a genuine positive change that transcends the psychological functioning level and the self-awareness level of life – simply beyond physical and psychological functioning levels prior to trauma.[6] Further, rather than the focus on the physical and pathological symptoms which have been induced by the event itself, mentioned in PTSD, the posttraumatic growth implies a more comprehensive concept focusing on the psychological and subjective response, the individual internal-strengths and adaptive aspects, which would be experienced in the event experiences.[7]

These positive changes had been diversely interpreted by each scholar, which had been used in various terms, such as discovery of benefits, stress-related growth, etc., by the 1990s, but Calhoun and Tedechi suggested the

terminology of 'Posttraumatic Growth', different from their concept.[8,9] Examining the research trend on the posttraumatic growth in the meantime, the initial studies on posttraumatic growth have been performed in the field of psychology, but in recent years, the research has been actively conducted in nursing, medicine, etc., as the interest in prevention of diseases and health promotion increases.[3] In most precedent studies, the studies concentrating on the posttraumatic growth for specific disease subjects including cancer patients, women experiencing physical violence, the subjects who have experienced war have been conducted. However, the posttraumatic growth studies for high-risk occupational groups experiencing various traumatic events, like police officers, fire-fighting officers, and prison officers, are in very short.

Thus, this study is going to search for and then, systemically investigate various variables related to the posttraumatic growth of police officers.

Study Method

Selection of Searching Database: In terms of searching, the literature search started from 1996, when the posttraumatic growth was developed and the term of the original author began to be used, and all the literature associated with the related keywords and the like were searched by January 2018 based on the search date. In order to conduct the systematic literature review of this study, researcher collected studies focusing on the posttraumatic growth aimed at police officers. In this study, Pubmed, Ovid-medline, Ovid-Embase and The cochrane library were used as the overseas database and RISS (Korean/English) as the Korean one. The research objects included Police officers, Police, Trauma, Posttraumatic growth, and Growth. In addition, the literature search was limited to articles providing abstract and full text.

Literature Screening and Quality Assessment: Based on the literature search strategy, all literature retrieved by each database was merged and then, the duplicate literature was removed. After the elimination of duplicate literature, the studies that did not satisfy the core questions of this study were excluded through the titles and abstracts of the primary study. The primary study, which was unclear to judge whether it might be selected or excluded or which fully met the selection criteria, based on the title and abstract, was judged by securing the full text.

As all the primary studies included in the literature review of this study are the study analyzing correlations, the quality evaluation on the literature was conducted by utilizing the 'Quality Assessment and Validity Tool for Correlational Studies' which was used in the existing study of Wong and Cummings.[10]

Results

Based on the literature search criteria of this study, the total number of retrieved literature was 2683 units, and of these, 420 duplicate literature units were excluded. Among 2263 theses by excluding 420 theses, 351 theses related to PTSD and 407 literature units were left by excluding 505 literature units which were not related to the subject, after reviewing abstract, titles and contents. Of them, in the posttraumatic growth, by excluding 322 theses which were studied on the samples not related to police officers of the subject of this study, 8 review theses, 18 qualitative research theses, 23 experimental theses, 4 non-English theses, and lastly, 11 literature units which were retrieved as the poster-presented literature, the final 24 theses were selected. 24 literature units were systematically analyzed by 2 researchers, and if the exclusion was not identical, they discussed it until they reached the agreement.

Discussion

In this study, with respect to the correlations between variables related to posttraumatic growth of police officers, it was found in Koreanstudies that self-esteem, problem-centered coping, emotion-centered coping, self-exposure, social support, and intentional rumination had a significant correlation with posttraumatic growth. These results are in agreement with the study[21] that the higher self-esteem becomes, the higher posttraumatic growth is, and since self-esteem correlates with positive cognition control strategies, it is considered that it has the significant correlation with posttraumatic growth, as a factor of protection and internal growth to control negative emotions in the process of accepting events after experiencing traumatic events. In other correlation studies, problem-centered coping and emotional-centered coping also showed a significant correlation with posttraumatic growth of police officers. This suggests that the adaptive mechanisms and responses will vary depending on the stress coping strategies used by individuals, even if they may experience the same trauma. In the precedent study[22], they stated that if the negative emotions, such as trauma and stress, was controlled

well, and the emotion-centered coping was well exerted after the traumatic experience, so that problem-centered coping, one of the active coping strategies, was utilized more, it would be in charge of the responses for well-understanding of their own psychological emotions and expression of their emotions. Therefore, the stress coping strategies, such as problem-centered coping and emotional-centered coping, after traumatic events, will be served as important variables to induce the posttraumatic growth. Self-exposures were also established to have a significant correlation with posttraumatic growth, and in the precedent study[15], it was said that those who actively engaged in self-disclosure were more likely to participate in cognitive processes related to growth than those who did not. It was confirmed that self-exposure was statistically related to posttraumatic growth as an important factor of psychological recovery in the growth of trauma experience. In the precedent studies[15,16,17], social support and intentional relativity also showed a significant correlation with posttraumatic emotions. In precedent research[23], when social support was well supported after experiencing the traumatic event, it was considered to be an important factor in well coping with stress situations and functioning for the psychological adjustment in adverse situations, which was regarded as an important parameter to induce posttraumatic growth after experiencing the traumatic event. Finally, intentional rumination was found to have a significant correlation with posttraumatic growth, which was considered as an important parameter to promote posttraumatic growth to bythinking carefully about the cast through that event and discovering the positive meanings or benefits from that case, rather than that the trauma experience was not just regarded as a negative event[23]. As a result of precedent studies of such Koreanstudies, the valuables significantly correlated with posttraumatic growth was found to be self-esteem, problem-centered coping, emotion-centered coping, self-exposure, social support, and intentional rumination. By getting out of these phases to explore the relations with valuables, the future research will provide the baseline data for developing programs to promote a positive and healthy direction and posttraumatic growth of police officers, and be helpful as an important factor in conducting a more realistic and multifaceted research. In overseas theses, as the posttraumatic growth-related variables, prosperity and resilience, appreciation, traumatic event threatening the personal life, stress induced from human relations, severity of trauma, PTSD symptoms, relationship stress, working stress, and depression were identified. It suggested that in overseas studies, Positive variables, such as prosperity and resilience, and negative variables, like stress and trauma, were found to be more variously related to posttraumatic growth than in domestic ones, as a variable related to posttraumatic growth of police officers. Prosperity and resilience were found to be significantly correlated with posttraumatic growth in the precedent theses. In the positive psychology, the constructively adaptive ability, well-being, and individual strengths focused on the prosperity of humans, and in the self-formation and prosperity theory, Frederikson[24] argued that the positive emotions, such as prosperity, would undergo a process to promote posttraumatic growth. In addition, referring to resilience as one of coping abilities when confronting a crisis after generally experiencing a traumatic event, he stated that this had a static correlation with posttraumatic growth causing less psychological trauma in crisis. Finally, the appreciation, as a positive variable, corresponded to the study results[25]suggesting that the higher the appreciation tendency, the higher the posttraumatic growth.

Conclusion

The purpose of this study was to investigate and explore the precedent literature on posttraumatic growth aimed at police officers, to establish the variables related to the posttraumatic growth of Korean and abroad police officers, and at the same time, to provide baseline data for the development of programs that can promote posttraumatic growth. In the present study, as a result of investigating the literature that have been created since 1996 when the term of posttraumatic growth was firstly used, in the Korean theses, self-esteem, problem-centered coping, emotion-centered coping, self-exposure, social support, and intentional rumination were identified and in overseas theses, prosperity and resilience, appreciation, stress caused by traumatic events threatening the individual live and human relationships, severity of trauma and PTSD symptoms, relation stress, work stress, and depression were confirmed.

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HIV Stigma among Clinical Medical Students in East Java, Indonesia

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Abstract

Background: HIV-related stigma is considered as major barrier for controlling the spread of HIV/AIDS. People living with HIV/AIDS (PLWHA) that experienced stigma were less likely to disclose their HIV status to their sexual partners and health care professionals. Medical students as the future physicians are expected to be at the forefront to prevent and treat HIV/AIDS. This study aims to explore the stigmatized attitude and practices towards HIV/AIDS patients among medical students in East Java, Indonesia.

Material and Method: Observational study was conducted at one of the faculty of medicine in public university in East Java, Indonesia. Respondents of this study was last year clinical medical students. Instrument used in this study was self-administered questionnaire that assess medical students attitudes and practices towards PLWHA.

Results: Most respondents empathize PLWHA patients equally with non-PLWHA. Forty percent of the respondents agreed that PLWHA needs to be separated from non-PLWHA in health care services. Around 39% of the respondents think that PHLWA should not become a healthcare worker and Eighty two percent of the respondents did inform their friends if there was a PLWHA patient to be cautious. More than half of the respondents used unnecessary protection when examining PLWHA patients.

Conclusion: HIV-related stigma among clinical medical students in East Java was still exist, in both attitudes and practices. Medical schools should consider developing a teaching method that improves their students attitudes and behaviors towards PLWHA patients.

Keywords: *HIV, Stigma, Medical Students, Indonesia.*

Introduction

HIV/AIDS is still one of the most important global public health problem. Globally, 2.1 million people were estimated to have become newly infected with HIV, representing a rate of 0.3 new infections per 1000 uninfected people in 2015. An estimated 36.7 million people were living with HIV at the end of 2015[1]. Data from USAID showed that around 620000 people living with HIV in Indonesia with 48000 new infection in 2016, and among them only 13% accessing antiretroviral therapy (ART)[2].

HIV/AIDS related stigma is considered as major barrier for controlling the spread of HIV/AIDS. Stigma is not only devastating for social and economical aspect of the individual, but also a major barrier for accessing HIV/AIDS prevention and treatment services. Feeling afraid of being stigmatized is the main reason why people feel reluctant to see doctors for having HIV counseling and testing (HCT)[3,4]. HIV/AIDS related

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stigma also impact patient's adherence to highly active anti-retroviral therapy (HAART). People living with HIV/AIDS (PLWHA) who disclosed their status were likely to skip doses to avoid their families, friends, or doctors finding out their status[5]. Study conducted in 4 countries in Asia (Indonesia, India, Philippines, and Thailand) shows that 80% of HIV respondents reporting discriminatory experiences, including discrimination in the health sector (54%), community (31%), family (18%), and workplace (18%)[6].

Good health care access is important for maintaining quality of life PLWHA. HIV/AIDS-related stigma from health care providers result in lack of access or delayed access which speeds up progression of the disease [7]. There are only 3 studies in Indonesia about the HIV/AIDS-related stigma in health worker until now, and all of the studies found that HIV/AIDS-related stigma among health care worker did exist, and it is unacceptably high [8-10]. Although only few studies conducted in Indonesia, stigmatizing attitudes toward PLWHA likely to occur in clinical settings throughout the country.

Medical students as the future physicians are expected to be at the forefront to prevent and treat HIV/AIDS. Thus, their professional behavior and attitudes against HIV/AIDS patients have profound impact on the course of the disease, treatment compliance, and prognosis. Until now, there are no study regarding the HIV/AIDS-related stigma among medical students. This study aims to explore the stigmatized attitude and practices towards HIV/AIDS patients among medical students in East Java, Indonesia.

Material and Method

This study was a observational study conducted in March 2017 at one of the faculty of medicine in public university in East Java, Indonesia. This study follows the principles of the Declaration of Helsinki. All respondents gave their informed consent prior to their inclusion in the study. Information for informed consent was given before respondents signed the informed consent. Details that might disclose the identity of the respondents under study were omitted.

In general, medicine in Indonesia is taught in minimum of 11-semester and divided into two phases. The first phase is preclinical study, consisted of 7-semester study program. The second phase is clinical study, consisted of 4-semester study program. After the students finish the second phase, they are eligible to take national examination, consist of theory and Objective Structure Clinical Examination (OSCE) test. After students pass the national examination, they are entitled for Medical Doctor degree. In this study, the respondents were medical students whose already finish their clinical study in the academic year of 2016/2017 but not yet took the national examination. We choose these students as respondents in our study because they had already interacted with patients and involved in the tending process during their clinical study.

Study instrument in this study was self-administered questionnaire, consisted of three sections as follows: 1) The characteristic of the medical students; 2) The medical students attitude towards PLWHA; and 3) The medical students practice towards PLWHA during their clinical years. The medical students attitude section contained 9 questions, and the medical students practice section contained 8 questions. There were only 2 possible responses to each statement in attitude and practice section, which were 'yes' or 'no'. The questionnaire was given to the respondents in Indonesian. We did not measure the score in each section of the questionnaire in this study. All the acquired data from the questionnaire was entered to SPSS (SPSS Inc., Chicago, IL, USA) for descriptive analysis.

Results

A total of 150 medical students were recruited as respondents, with the response rate of 100%. Mean age of the participants was 23.23 ± 0.734 years old. There were more female respondents than male respondents in this study. Most of the participants had an average GPA of 3.0-3.5 out of 4.0 throughout their study as medical students. More than half of the respondents was raised in the healthcare worker (HCW) family (table 1).

In the medical students attitude towards PLWHA section, almost all of the respondents would have a friendship with PLWHA. Forty percent of the respondents agreed that PLWHA needs to be separated from non-PLWHA in the health service. There were 28% of respondents that would prefer to treat PLWHA. Few respondents agreed with the statement that PLWHA doesn't deserve to be cured, and 28.7% agreed that all PLWHA got the disease because of their own fault. Around 39% of the respondents agreed that PLWHA should not become a healthcare worker, and 15.3% agreed that PLWHA has no right to be a public figure or leader (Figure 1).

In the medical students practice towards PLWHA patients section, most of the respondents empathize PLWHA patients as much as they empathize other patients. Eighty two percent of the respondents did inform their friends if there was a PLWHA patient so that their friends will be more careful in tending that patient. There were 20% of the respondents who did not do complete physical examination on PLWHA patients as complete as on other patients, and 33.3% try to avoid physical contact with the PLWHA patients. More than half of the respondents used unnecessary protection when examining PLWHA patients. Around 20% of the respondents did HIV screening test in the patients that they suspect of having an HIV infection without making any proper counselling (Figure 2).

Table 1. Characteristic of the respondents

	N (%)
Age (Mean ± SD)	23.23 ± 0.734
Gender	
Male	64 (42.7)
Female	86 (57.3)
GPA	
2.5 – 3.0	5 (3.3)
3.0-3.5	122 (81.4)
>3.5	23 (15.3)
Family Background	
Health worker	50 (33.3)
Non-health worker	100 (66.7)

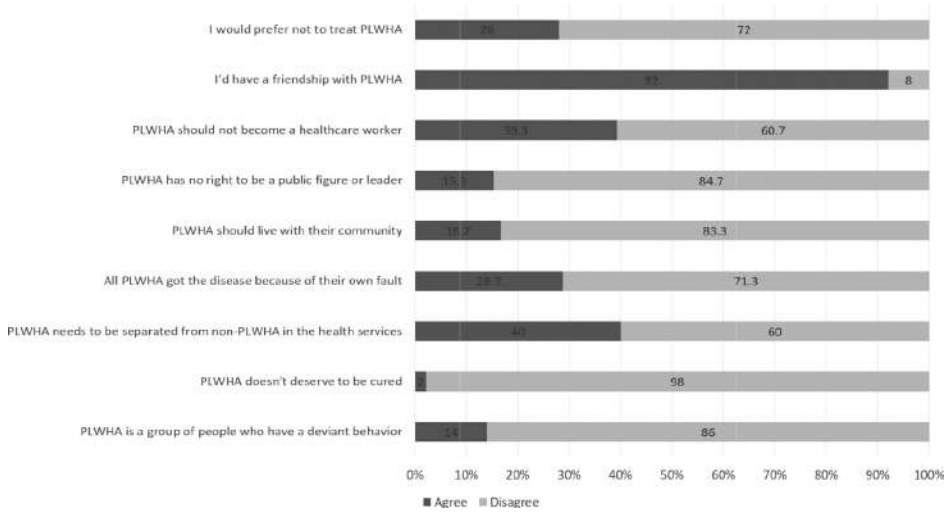

Figure 1. Medical Students Attitude Towards PLWHA

The percentage represents the number of respondents who agreed (dark grey) or disagreed (light grey) with the following statement out of 150 respondents in this study.

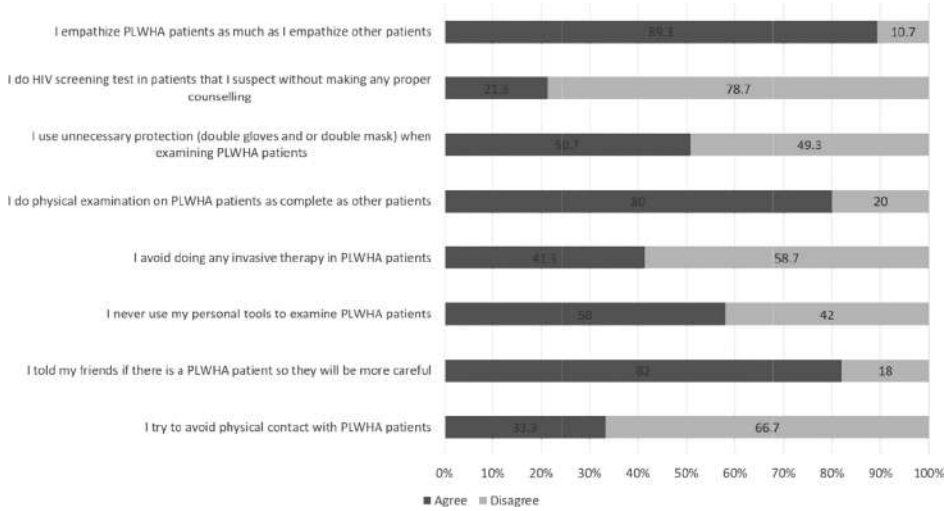

Figure 2. Medical Students Practice Towards PLWHA Patients

The percentage represents the number of respondents who agreed (dark grey) or disagreed (light grey) with the following statement out of 150 respondents in this study.

Discussion

We found that there was still stigma towards PLWHA among medical students in Indonesia, which was observed in their attitudes and practices toward PLWHA. There were several previous studies that evaluate the attitude of medical students regarding HIV/AIDS that shows same result to stigmatizing attitude[11-14].

Almost all respondents in our study had an average GPA of 3.0 to 3.5 out of 4.0 throughout their study in medical faculty. Several studies have been conducted to seek the correlation between knowledge and stigmatizing attitude towards HIV/AIDS among medical students. Previous study in China found that there was no association between knowledge of medical students in HIV/AIDS and stigmatizing attitude [11]. Other studies found that there are no positive changes in students' attitudes as students progressed through their studies although their knowledge showed a significant improvement[12-14].

There are several studies that compare the knowledge and attitude between medical students and students from other faculties. Study by Turhan et al which compare the knowledge and attitude of students from faculty of medicine, faculty of dentistry, and medical technology vocational training school towards HIV/AIDS found that there was no significant difference between these students in terms of both knowledge and attitude [14]. In contrary, study done by Chauhan et al showed that HIV/AIDS knowledge in medical students was higher than allied health sciences students, and the attitude was also more positive[15]. Comparative study between final year of medical and pharmacy students conclude that overall medical students' knowledge appeared to be better than pharmacy students regarding HIV/AIDS, and there was significant difference between students group in attitudes and risk perceptions about HIV/AIDS [16]. Until now, there are no study that compare between medical students and society in general.

There were only 3 studies regarding HIV-related stigma in Indonesia among HCW to date, and only 1 study involved medical student intern. Study of HCW in Banda Aceh city found that the average of stigmatized attitudes among doctors and medical student interns was significantly lower from those of nurses [8]. Another study in Aceh region conclude that although the HIV caseload is very low, the discriminatory attitude was high. Discriminatory attitudes were higher amongst HCW with low-level of formal education and low-level knowledge on transmission and prevention of HIV, non-doctor profession, Islam, have not experience direct contact with HIV-positive patients, rarely attend HIV/AIDS-related trainings, high value-driven stigma and overestimated risk to HIV transmission, and working in bad health facilities [10]. Study done by Walyuo et al. among 396 nurses at 4 different hospital in Jakarta, the capital city of Indonesia, found that stigmatizing attitudes towards HIV were significantly predicted by formal education, HIV training, perceived workplace stigma, religiosity, Islamic religious identification, and affiliation with the Islamic hospital, but not by HIV knowledge[9].

In order to reduce HIV/AIDS stigma, knowledge alone is not adequate if not followed by proper clinical experience and clinical situational analogue training [17]. Moreover, in order for knowledge itself to change the medical students' attitude, more time is needed. Personal experience and convincing role model also plays role in building the knowledge to prevent HIV-related stigma. [13]. To our knowledge, medical schools in Indonesia did not gave specific lecture and training to eliminate the stigma. This issue is similar to Israel, where HIV content taught in medical schools curricula focus mainly on matters such as the pathogenesis of HIV infection and the affects on its host, but there are no specific programs that pruposely address the importance of preventing stigma and if it already occured, dealing toward specific patient populations [12]. Previous studies found that the medical students' main source of HIV/AIDS information is not from the class lecture, but from the mass media instead[12,15]. Because most of the medical students receive information about HIV/AIDS from the same source as general population, one might argue that these might be the reason why the stigma against HIV is still exist in medical students.

It has been suggested that other than providing adequate knowledge to medicals students, it is important to also focusing on dealing with stigma, anxiety and misperceptions about HIV/AIDS and PLWHA, Medical schools should modify their curricula to include teaching method aimed at improving HIV-related attitudes and behavior, and adherence to medical professionalism. It could be done by providing the lecturer's comprehensive experience that address all the possible prejudice and

discriminatory health beliefs in the students, engaging PLWHAs to speak of their life experience and interact with the students, bed-side teaching with PLWHA supervised by an experienced physician who was a proven good role model in clinical practice and teaching, having a structured elective program for knowledge enhancement and cognitive exercise to improve their skills in handling PLWHA[11-16].

Conclusion

HIV-related stigma among clinical medical students in East Java was still exist,in both attitudes and practices. Having a knowledge of HIV/AIDS does not guarantee that there will be no stigmatizing attitudes towards PLWHA. Other than providing adequate knowledge by giving classical lecture, medical schools should also develop a teaching method that improves their students attitudes and behaviors towards PLWHA patients before they enter their clinical years study. Future study needs to be done to compare the attitude between medical students and society in order to evaluate the effectivity of the teaching method regarding the HIV-related stigma.

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Effectiveness of Falls Prevention Education on its Prevention Behavior among Older Adults: A Systematic Review

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Abstract

Introduction: Falls prevention education is important to provide early awareness of falls prevention among older adults. However, information on the effectiveness of falls prevention education on its prevention behavior among older adults is limited.

Objective: The objective of this systematic review was to identify effects of falls prevention education on the practice of falls prevention behavior among older adults.

Method: A search of three electronic databases: PEDRO, EBSCHOHOST and OVID & MEDLINE, was performed in May and June 2018. Studies with falls prevention education as a single prevention intervention either in the hospital, long term care or community settings, participants aged 60 years and above and falls prevention behavior as an outcome measure were included.

Results: A total of 129 studies were found with 16 being duplicates. A total of 14 and 62 studies were excluded for review after screening by title and abstract respectively. Another 31 studies were excluded for not fulfilling the inclusion criteria. Only six studies were finally eligible for inclusion in our present review. The results of our review suggested that falls prevention education significantly improved falls prevention behavior practice among older adults. However, there is limited information on periodic falls risk screening or assessment practice among older adults.

Conclusion: Falls prevention education seems to be effective in heightening falls prevention behavior among older adults. More information about the effects of periodic falls risk screening or assessment on falls prevention behavior among older adults is required.

Keywords: *Falls prevention education; Falls prevention behavior; Elderly; Older adults.*

Introduction

Falls among older adults have been reported as one of the major causes of mortality and morbidity among older adults,[1] which can lead to serious and devastating consequences to older adults themselves, their families and their communities due to burden of care. Even though falls prevention programs have been implemented, the number of falls has not decreased. Moreover, the number of older adults who can be categorized as "old" is increasing and, as a result, the number of falls will also be increasing.[2]

Falls prevention behavior is referred as the prevention strategies adopted and practiced by older adults in their daily life, to protect themselves from falls.[3] It had been reported that older adults tend to behave carefully to prevent falls with advancing age which indicate their awareness about falls prevention.[4] Nevertheless, there are older adults who fall due to risky behaviors. Jeon et al.[5] reported that the reasons behind such risky behaviors were increased self-confidence, pride and contentment.

Hence, falls prevention education, in particular, the identification of individual risky behaviors, is significant to provide early and self-awareness of falls prevention among older adults. While, falls prevention education is an important components in the efforts to prevent falls, its focus has been on the fall rate and

number of injurious falls and percentage of older adults who fall.[6,7] Information assessing the effectiveness of falls prevention education as an intervention on its own right and in the adoption of falls prevention behaviors is limited. Our current review was conducted to identify the effects of falls prevention education program on the practice of falls prevention behavior among older adults.

Methodology

Search Strategy: We searched for computer-based electronic databases: EBSCHOHOST, OVID & Medline, and PEDRO, in May and June 2018.

The search was done based on the Population Intervention Comparisons Outcomes Study Design framework. The search applied the following keywords: "falls prevention education", "falls prevention behavior" or "falls prevention practice" and "elderly" or "aged" or "older" or "elder" or "geriatric". Similar keywords were used in each database. The keywords were truncated to search for any studies which were related to the root words. Boolean operator 'OR' and 'AND' were applied to combine the keywords.

Study Selection: Literature selection criteria were as follows: studies in which (1) participants were aged 60 years and above; (2) falls prevention education was used as a single intervention; (3) falls prevention behaviors were addressed as an outcome measure; (4) peer-reviewed publications; (5) full text; and (6) available in English language. The researcher excluded retrospective studies, such as case-control studies, studies that were not diagnostic, not original or did not provide sufficient information to identify falls prevention behaviors.

All duplicates were removed from the initially retrieved articles. Inclusion and exclusion criteria were then used to examine the titles and abstracts. If it was difficult to decide whether to include a retrieved article, its main text was reviewed. Two independent reviewers reviewed all processes and a third party was consulted if there was any disagreement.

Quality Assessment: Modified McMaster Quantitative Critical Appraisal Tool (MMQCAT) was used to critically appraise the quality of each included studies. MMQCAT was developed by Law et al. (1998) to critically appraise the papers which report the quantitative studies by considering 15 criteria (Table 1). A higher total score with a maximum total score of 14, was then indicates a higher quality of the reporting studies.

Results

Selection process and bias risk assessment: A total of 129 articles were retrieved from the electronic databases. Sixteen duplicate articles were removed and the titles and abstracts of the remaining (113) articles were examined based on the inclusion and exclusion criteria. The main text was reviewed if it was difficult to make a decision. Finally, 6 articles were included for review.

Participant Characteristics: The effectiveness of falls prevention education on the practice of its prevention behavior was examined among a total of 459 older adults aged ≥60 in the six reviewed studies. Three studies were conducted in the senior community centers, facilities or housings.[8–10] One study was carried out in long term care setting, a nursing home. Whereas, another two studies were conducted among patients in hospitals[11] and those discharged to the community.[12] The reviewed studies were from mainly Asia[3,8,10] and Asia Pacific regions.[9,11,12]

Comparison Groups: In two studies falls prevention education was compared to usual care.[10,12] In one study there was no comparison group.[3] General education for the comparison group was provided in one study.[8] While, in another study the effectiveness of education provided was compared between that delivered via workbook and DVD.[11] Specifically tailored falls prevention education between two groups (authenticity and motivation) was compared in one study.[9]

Quality Assessment: The assessment of the methodological quality for each study is presented in Table 1.

The total scores of MMQCAT of the review studies ranged from 9 to 12 out of a maximum score of 15.

Table 1: Quality assessment

Authors	Criteria (Modified McMaster Critical Appraisal Tool for Quantitative Study)															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total Score
Uymaz & Nahcivan (2015)[3]	/	/	Pre-post	x	x	/	/	/	x	x	/	/	x	/	/	9
Jang & Lee (2015)[8]	/	/	Q-E	/	/	/	/	/	x	x	/	/	x	/	/	11
Chen (2013)[10]	/	/	Q-E	/	/	/	/	/	x	x	/	/	x	/	/	11
Hill et al. (2013)[12]	/	/	Pilot RCT	/	/	/	/	/	x	x	/	/	x	/	/	11
Schepens et al. (2011)[9]	/	/	RCT	x	x	/	/	/	x	x	/	/	/	/	/	12
Hill et al. (2009) [11]	/	/	RCT	x	x	/	/	/	x	x	/	/	x	/	/	9

MMQCAT Criteria: 1) clearly stated study purpose; 2) background of literature review; 3) appropriateness of study design; 4) sample described in details; 5) sample size justification; 6) reliability of outcomes measures; 7) validity of outcomes measures; 8) intervention description; 9) contamination avoided; 10) co-intervention avoided; 11) result were reported based on statistical significance; 12) appropriateness of statistical analysis method; 13) clinical implication reported; 14) dropouts reported; 15) relevant conclusion RCT = Randomized Control Trial; PRCT= Pilot Randomized Control Trial; Q-E = Quasi-Experimental = Yes (1 point); x = No, Not Address, Not Applicable (0 point).

Contents of falls prevention education: In most of the studies, falls prevention education included topics such as definition, causes, risk and consequences of falls. As for falls preventive measures, regular exercise, periodic eye examination, safe drug use, environmental change and protective behavior development were the main highlights.

Method used to deliver falls prevention education in each setting

Mode of delivery: Majority of the studies used face-to-face session as the mode of delivery for falls prevention education.[3,8–12]

Intervention settings: One-to-one education session was applied mostly,[3,9–12]while only in one study a group-based settings for falls prevention education was used.[8]

Material provided: Multimedia such as videos (DVD), was the most common method used to deliver the falls prevention education in most settings (5 studies).[3,9–12] The combination of video materials, medication counseling and poster presentations were used in one study[3] with both video and written falls prevention education materials used in another one.[12] In the study by Jang & Lee [8], both booklets and presentation files were used. Individually tailored multimedia based falls prevention education was applied in one study.[9]

Duration of intervention: Multiple sessions of falls prevention education were used in two studies.[8,12] In the rest of the studies only one session was conducted.[3,9–11] The overall duration for each session ranged from 15 minutes up to 1 hour.

Findings of the Studies: Falls prevention behavior was assessed using a variety of self-reported outcome measures. Some of these outcomes were used in combination. In all studies, falls prevention education was found to have a positive effect on at least one practice of falls prevention behavior among older adults. In two thirds of the studies, a positive effect on various aspects of falls prevention behavior was demonstrated in older adults.[3,9,10,12] One out of six studies addressed positive impact on the behavioral intention towards or on home renovation.[8] While, in one study significant effect of falls prevention education on identifying its strategy to reduce falls was reported.[11]

Discussion

In our review, we aimed to identify the effectiveness of falls prevention education as a stand-alone intervention on the practice of its prevention behavior among older adults. We found that falls prevention education has been used as a single intervention, delivered using several method and was effective in promoting at least one falls prevention behavior among older adults.

The results of our review demonstrated that face-to-face session was the most preferable mode of delivery for falls prevention education. The possible reason for this preference may be due to the report that such method leads to a larger positive effects.[13] Mostly,

falls prevention education was conducted via one to one education session with group education method used only in one study by Jang & Lee (2015).[8] Falls among older adults could be due to multiple risk factors and may be different in individuals. Hence using individually tailored method may be more effective in addressing the specific risk in individuals.[9,15]

Our review results suggested that there is no difference in the contents for falls prevention education based on settings of the study. Generally, falls prevention education components that were delivered focused on falls consequences, risks, and its prevention strategies such as regular exercise, periodic eye examination, safe drug use, environmental changes and protective behavior development. This is in line with the updated falls prevention guidelines by National Institute for Health and Clinical Excellence (2015, updated 2017). Recent emphasis has been on early falls risk identification using multifactorial assessment identification among older adults with risk of falls. Suggested multifactorial assessment includes: (1) falls history; (2) balance, gait, mobility and muscle weakness; (3) risk of osteoporosis; (4) perceived functional ability and fear of falling; (5) visual impairment; (6) cognitive and neurological impairment; (7) urinary incontinence; (8) home environment and; (9) medication review.

In regard to the method used for falls prevention education, video (DVD), written information and posters were mostly used. However, video educational delivery method was most preferred by older adults due to its attention grabbing aspects, ability to relate and engage multiple senses.[16] Our results showed that the outcomes were not influenced by the method used to provide falls prevention education. In most studies, these method were used in combination. Similar method were utilized to engage participants below age 60 in falls prevention practice.[17] Up to date, there were no falls prevention education delivered via web based method. It is noteworthy that web-based education has been demonstrated to improve awareness of physical activity among older adults.[18]

Facilitating positive effects on practice of falls prevention behavior through related educational intervention has been explained using health belief model (HBM).[19] Summarized findings from a previous review[20] suggested that falls prevention education may have a positive effect across a range of outcomes, but the findings focused primarily on falls rate, number of injurious falls, perception of falls risk, knowledge and self-efficacy. Despite consistent positive outcomes, the measures were neither uniform nor clear.

One of our study limitation is that by including falls prevention education as a single intervention, there were limited studies which fulfilled this inclusion criteria. Although the general is ability of our review findings may be limited, it provided information if falls prevention education could be used as a single intervention. This method may be more cost effective in addressing falls prevention as an early health promotion and prevention strategy among community dwelling older adults.

Our review has highlighted the need for developing and implementing generic falls prevention education programs and standardized outcomes measures in future research. The results of our review indicate that falls prevention education as a single intervention is effective in facilitating the practice and engagement of falls prevention behaviors among older adults. To determine futuristic best practice in engaging the community in the prevention of falls among older adults, it is important to determine the effectiveness of using mobile health falls prevention education and periodic falls risk screening or assessment.

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Ethical Clearance: Ethical approval was obtained for this study from the Secretariat for Research and Ethics of University Kebangsaan Malaysia.

Conflict of Interest: Nil

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Chipping Resistance of Nanosilica Treated Zirconia Cores Veneerd with Porcelain after Thermocycling and Cycling Loading

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Abstract

Aim: This study was conducted to evaluate the effect of nanosilia surface coating of pre-sintered zirconia on chipping of veneered zirconia crowns after thermocycling and cyclic loading.

Method: Twenty zirconia cores were subjected to nanosilica slurry treatment before sintering then veneered and fired to produce crowns. The crowns ere cemented by resin cement on their epoxy dies and 10 crowns were subjected to 10000 thermocycles and 10000 cyclic loading. All crowns were loaded till chipping of veneer layer then the chipped surfaces were examined by SEM/EDX.

Results: Crowns which were subjected to thermocycling and cyclic loading gave lower chipping resistance than the non-aged crowns.

Conclusions: Treatment of zirconia cores with nanosilica before sintering and after thermal and mechanical aging didn't increase the chipping resistance of the veneer layer.

Keywords: *Nanosilica, Zirconia,Chipping,Veneer.*

Introduction

Yttria-stabilized tetragonal zirconia polycrystal (Y-TZP) became the most ceramic material used for production of fixed partial dentures. The successful outcome of Y-TZP has been associated with the intrinsic material toughening mechanism that occurs through phase transformation from tetragonal to monoclinic crystalline form[1,2].

Due to the relative opacity, zirconia substructure needs to be veneered for better esthetic performance. Veneering porcelains are used to coat the surface of zirconia to enhance the natural appearance of prosthesis. Porcelain-veneered zirconia restorations are subjected to failure by the fracture of the veneering layers which dominant clinically observed failure mode and it iscalled chipping[3].

Studies proved that nano silica had performed greatly in many branches of dentistry[4,5]. Modifying zirconia surface in its pre-sintered stage is an effective technique to change the properties of zirconia based dental restorations[6].

Many previous studies documented that thermal and mechanical aging for the prediction of restorations durability is recommended as they simulate oral conditions in thermal and mechanical fluctuations with less period of time and they have great effect on the chipping resistance[2,7,8].

Hypothesis: The treatment of zirconia core surface with nanosilica before sintering may increase the chipping resistance of the veneer layer.

Aim of the study: To evaluate the effect of nanosilia surface coating of pre-sintered zirconia on chipping of veneered zirconia crowns after thermocycling and cyclic loading.

Method

A model acrylic tooth (Typodont, Columbia) simulating mandibular first molar was prepared after imbedding vertically in a cylindrical Teflon mold with self-cured acrylic resin (Trayresin™, Dentsply sirona, USA) to obtain a full anatomy ceramic crown preparation having the dimensions of 1.5mm Axial walls reduction, 2mm occlusal surface reduction and 1mm gingival margins reduction using a high speed hand piece (NSK, Tokyo, Japan), size 010,012 tapered diamond stones with flat end and size 012 flame shaped stone (Dentsply, sirona, UK). The angle of convergence was 6°-8° and all line angles were rounded to prevent stress concentration.

Twenty silicon impressions (Speedex®, Coltène/ Whaledent AG Altstätten, Switzerland)were recorded for the prepared acrylic tooth by using double mix 2 steps technique (heavy and light). Impressions were poured by epoxy resin die material (Kemapoxy 150, CMB international, Egypt) and the resulted dies dimensions were measured by a digital caliper (APT, china). Dies with dimensions exceed the range of error ±0.1mm were discarded.

Each die was coated with a thin layer of optical reflection spray (Occlutec Spray, Renfert Dental Corp, USA) and optical impressions were recorded using a scanning machine (Ceramill map400, Amnn Girrbach, Austria). Twenty zirconia cores (Ceramill zirconia, Amnn Girrbach, Austria)were designed and milled by the aid of computerized milling machine (Ceramill map400, Amnn Girrbach, Austria) with a uniform thickness of 1mm and with cuspal inclination of 30°. Milled cores were air dried with oil free air for 1 minute.

Nanosilica slurry was prepared by mixing the nanosilica powder of average size 40 wt% (Jiangsu, Mainland, China) with ethyl alcohol (Elahram, Cairo, Egypt) by ratio 4:1 wt%. The slurry was applied to the outer surface of zirconia cores with porcelain brushes size 4 and 6 (Koli, Bredent, Germany).Surface treated zirconia cores were sintered in a sintering furnace (Ceramill therm, Amnn Girrbach, Austria) following the manufacturer instructions.

A full-contour wax pattern with cuspal inclination 30° was built up onto one of the copings to mimic the final veneer layer dimensions; silicon impression was recorded for the pattern. This silicon key provided a uniform thickness and shape of the veneer layer for all specimens. Veneering porcelain (GC® Initial, Illinois, America) was sequentially built up by the same technician following the manufacturer's instructions with the help of the silicon key, followed by firing according to manufacturer instructions. The thickness of the crowns was measured with a digital caliper to ensure uniformity among all specimens.

Fired crowns were cemented to their corresponding dies using resin cement (Rely™ x ultimate 3M Deutschland, Germany). The cement was mixed and applied to the fitting surface of the crowns according to manufacturer instructions. The crowns were seated firmly and 1kg weight was applied to the occlusal surface for 3minutes to ensure equal pressure for cementation of all specimens. That was followed by light curing (LED blue phase, Ivoclar Vivadent, Germany) from each side for 10 seconds. The specimens were left undisturbed for 15 minutes and were stored in distilled water for 24 hours.

The specimens were divided into 2 groups (n=10). Group I was the control and group II was subjected to thermocycling and cyclic loading before chipping resistance test. Thermocycling was done in thermocycling machine (Robota automated thermal cycle; Bilge, Turkey). Thermocycling was performed for 10000 cycles intermittently with a 300 cycles per day in a water bath; dwell times were 25 seconds in low temperature point of 5C° and the high temperature point was 55 C° with the lag time of 10 seconds.

The thermocycled crowns were stored in distilled water for 24 hours and then they were transferred to chewing simulator (Robota, ad-tech technology, Germany) to receive 10000 successive compression loads with 200N. All specimens were stored in distilled water for 24 hours.

For chipping resistance test each cemented crown was fixed in the lower jaw of the universal testing machine (Instron, 3345L8741, Assembled Canton, USA). Compressive loadwas applied directly to the central fossa of crowns by a steel ball (5mm in diameter) with rate of loading 0.5mm/min. A piece of polyethylene sheet was placed between the ball and the crown in order to properly distribute the load.

The area of loading was calculated by the help of articulating paper (Zogear, China) to determine the points of loading between cusps and the steel ball. As the cuspal inclinations were tangential to the steel ball in certain points so the line between two opposing points

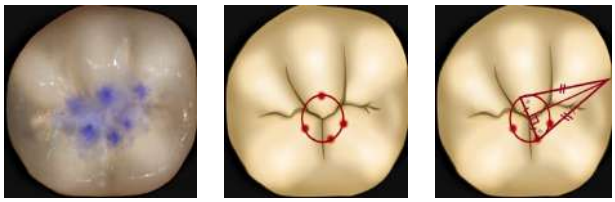
is the diameter of the formed circle. 3D CAD design software (Solid works 2015)[9] was used to help in drawing the circle and calculating the area (Figure 1,2,3); so by knowing the diameter of the drown circle; the area could be calculated through the following equation:

$$A = \pi r^2$$

Load was applied until chipping of the veneer layer took place. The load at chipping for each specimen was recorded and the compressive chipping stresses were calculated using the following equation:

$$\text{Chipping stress (MPa)} = \frac{\text{Load at chipping (N)}}{\text{Stress area (mm}^2\text{)}}$$

Fractured surfaces were coated with gold by gold sputtering machine (JEOL, JFC-1100E, Fine coat, USA.) then examined by scanning electron microscope (SEM) (JSM-IT200, JEOL ltd, Tokyo, Japan) and elemental analysis was performed by using energy dispersive x ray spectroscopy (EDX) in order to reveal the presence or absence of silica and its percentage.



A B C

Fig. 1: Carbon paper marks show loading points of steel ball on the crown (A). Diagram defines the loading points (B). Method of calculation of area of loading (C)

Results

I. Chipping Resistance: There was a significant difference between both groups in chipping resistance (p value was<0.05). Group I showed higher mean of chipping load which was 1300.404±340.361N with chipping stress of 413.877MPa. Group II mean of chipping load was 820.913±396.200N with chipping stress of 261.270MPa.

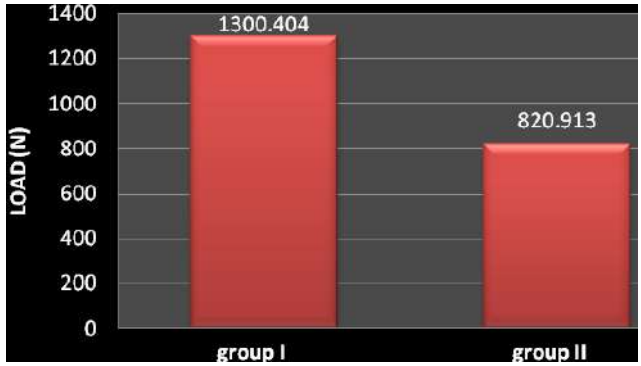


Fig. 2: Means of load at chipping of both groups.

II. SEM and EDX Results: Scanning electron microscope examination and EDX analysis showed that the mode of failurewas mainly mixed (70% of specimens)in group I in which there was areas of zirconia not covered with nanosilica in EDX analysis. The failure was mainly adhesive (70% of specimens) in group II in which the zirconia surface was completely covered withnanosilica revealing that the fracture was between nanosilica layer and veneer layer (Figure 3, 4).

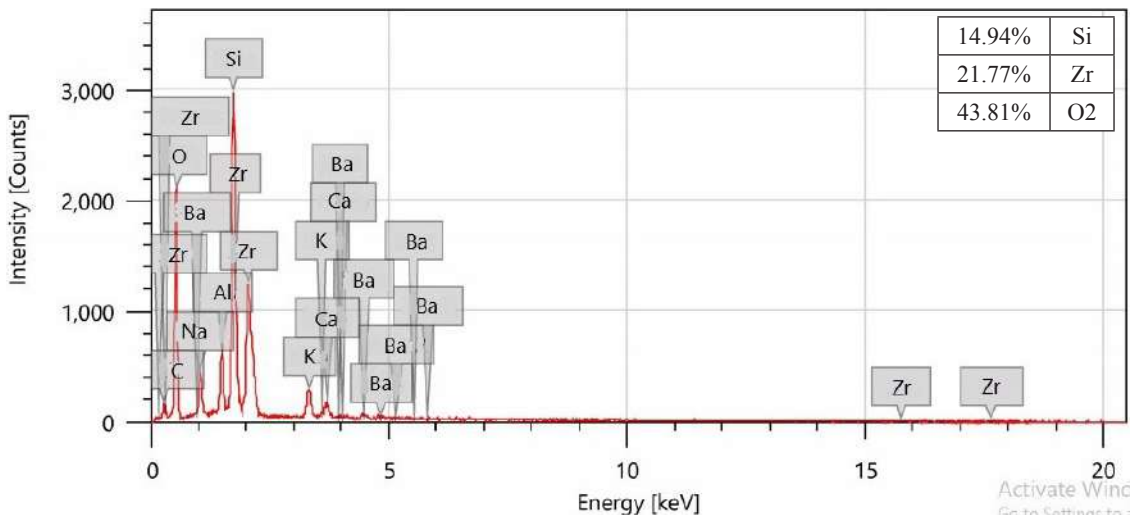


Fig. 3: EDX analysis of zirconia surface of group I(Mixed mode of failure).

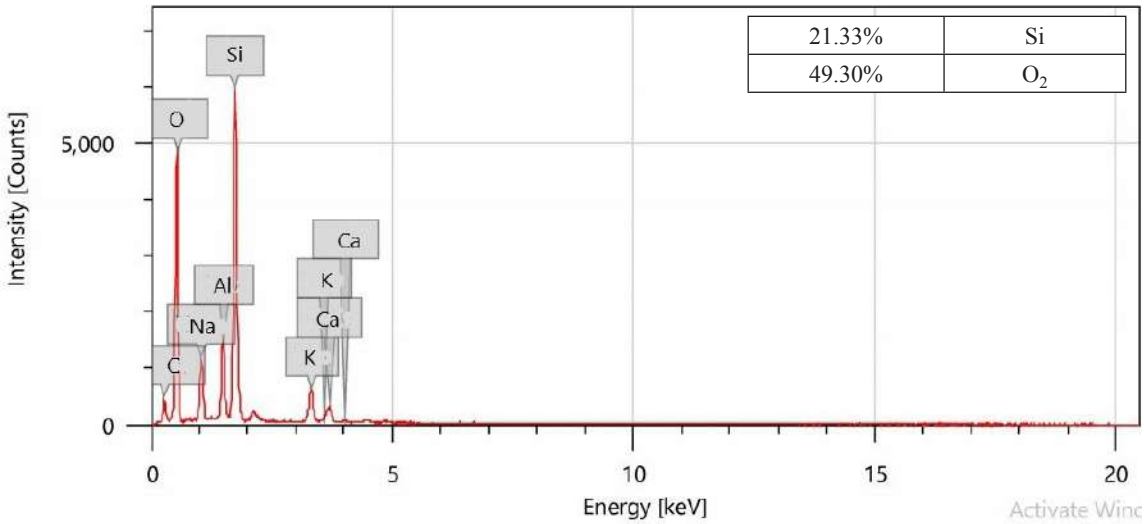


Fig. 4: EDX analysis of zirconia surface of group II (adhesive mode of failure).

Scanning electron micrographs of chipped zirconia showed areas of detachment in the mixed mode of failure and empty holes on the chipped veneers surface. In the adhesive mode of failure there were no empty holes (Figure 5).

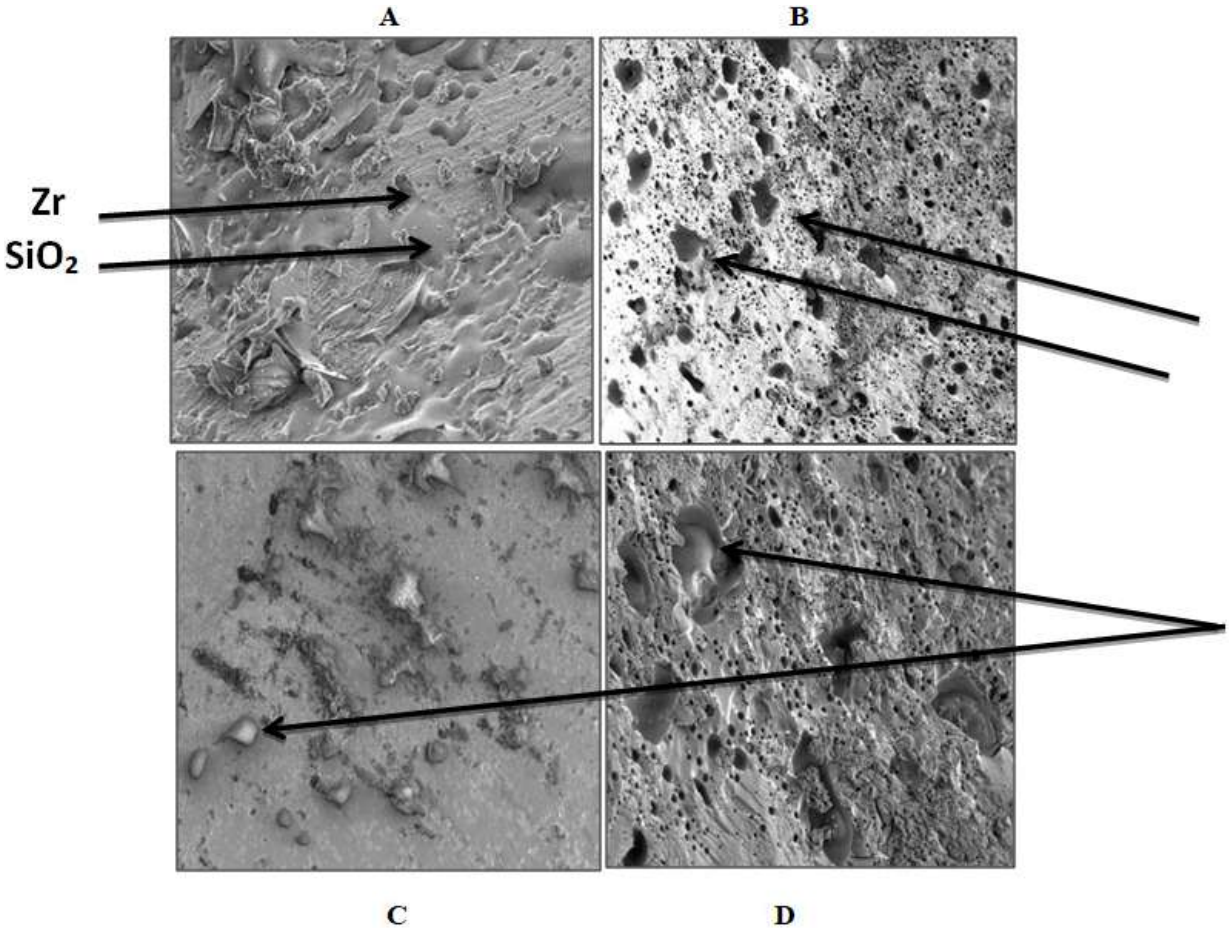


Fig. 5: SEM (800X) micrographs show the surface topography of zirconia core of group I (A); arrows refer to elevations. The opposing porcelain veneer surface of the same sample (B) after chipping; arrows refer to empty holes (Mixed mode of failure). The surface topography of zirconia core of group II (C) and the opposing porcelain veneer surface of the same sample (D) after chipping; arrows refer to silica rich areas (adhesive mode of failure)

Discussion

The incidence of veneering porcelain fracture when a zirconia core is used became a major complication that has been reported in the dental literatures. The cause of veneer chipping is complex material factors, including differences in coefficient of thermal expansion between veneer and core, likely create residual stresses which enhance veneer chipping[10-12].Evaluation and comparing chipping resistance of veneered zirconia crowns had been conducted in several previous studies[2,10].

This study was conducted to evaluate the chipping resistance of nanosilica treated zirconia-porcelain interface after thermocycling and cycling loading.

According to ISO 11405, the use of 500 thermal cycles between 5°C and 55°C is considered to be suitable to simulate short-term aging of dental materials[13]. In addition, *Gale and Darvell*[14] supposed that 10,000 cycles might represent approximately 1 year of *in vivo* functioning, with 20 to 50 cycles considered equivalent to a single day.

There is a large variation between number of cycles and the vertical loading applied in aging studies in the literature. Combining both thermocycling and cyclic loading is more clinically relevant protocol and might give prediction of longer time service[2,15,16].

The resulted load which cause chipping of veneers of group I was comparable to the results of previous studies with slight non-significant difference. This may be attributed to different techniques of veneering, different core design or thickness and different testing methodology[17-19].

Group II showed lower chipping resistance than previous studies; however it is important to consider that both groups showed higher loads than the maximum chewing forces reported in literature of previous studies. Studied showed that the average maximum biting force of healthy and young adults is approximately from 400 -700N[20,21]. Therefore, the results indicated that the load at chipping of both tested groups in this study may withstand the clinical services without failure.

Mode of failure in group II was mainly adhesive failure between silica and veneer. As stated by many researchers[22-24]that chipping mainly occurred due to difference in coefficient of thermal expansion which lead to unfavorable thermal stresses at the interface between silica and porcelain veneer layer. However, the SEM and the EDX results indicate the strong bond between the silica coat and zirconia.

The difference in coefficient of thermal expansion between silica and porcelain may be the cause of veneer chipping and lower chipping resistance than the control. This may draw a tension to the possibility of using a veneering ceramic compatible with the nanosilica coat.

Conclusions

Within the limitations of this study it was concluded that:

1. The treatment of pre-sintered of zirconia cores with nanosilica before sintering without aging lead to high chipping resistance.
2. Aging decreased this resistance to chipping but it is still within acceptable limits of human maximum biting force.

Recommendation:

1. Nanosilica layer thickness, particle size and shape play great role and should be subjected for further research.
2. The results of this study did not support the hypothesis but revealed that surface treatment of pre-sintered zirconia with nanosilica is a potential cause increasing chipping resistance if the composition of the veneering ceramics is modified to be compatible with the coefficient of thermal expansion of the nanosilica.

Ethical Clearance: Was taken from Faculty of Dentistry, Minia University.

Source of Funding: Was self-funding.

Conflict of Interest: Nil.

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Assessment of Fracture Force of CAD-CAM-fabricated Occlusal Veneer Restorations with Different Thicknesses

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Abstract

Purpose: To evaluate the fracture force of occlusal veneer restorations using ceramic material (Lithium di-silicate) and hybrid ceramic (VITA Enamic) Computer Aided Desingn/Computer Aided Manufacturer (CAD/CAM) material at different thicknesses after thermocycling.

Material and method. Thirty CAD/CAM occlusal veneer restorations were fabricated from group E (IPS e.max CAD), V (VITA Enamic) and divided into subgroups according to thickness 0.3, 0.6, 1 mm. The occlusal veneers were luted to epoxy dies (n=5). The specimens were subjected to thermocycling test then they were subjected to load until fracture using a computer controlled materials testing machine. Data were tabulated and statistically analyzed using Two-ways analysis of variance (ANOVA).

Results: There was no significant difference in the fracture force between the two materials regardless the thickness. The fracture force increases with the increase of the thickness.

Conclusion: VITA Enamic hybrid ceramic material is closer to IPS e.max CAD ceramic material in the fracture force. With the increase of thickness, it leads to increase of fracture force.

Clinical Implication: Within the limitation of this in-vitro study, hybrid ceramic (VITA ENAMIC) and IPS e.max CAD are clinically applicable as occlusal veneer restoration with thickness 0.6 mm and more.

Keywords: *Hybrid ceramics, Fracture force, CAD/CAM.*

Introduction

Ceramics are the materials of choice as long term functional indirect restorations, due to their properties esthetic, biocompatibility and high strength. Nowadays dental technologies such as CAD/CAM are in continuous evolution offering both, the dentist and the patient. All ceramic restorations are cemented by using resin cement as they provide low solubility and they have high bond strength and better esthetic. Due to high bond strength of resin to tooth structure and complicated bonding between ceramic and tooth structure, resin was added to ceramic material to make a new compound structure called hybrid ceramics. Resin bonding is required for clinical success of indirect restorations at long time. With the use of CAD/CAM indirect restorations, there is a need for successful bonding for new hybrid ceramic materials.[16] All ceramic materials are superior to composite in its physical and mechanical properties. The hypothesis of this study, that there is a significant difference between all ceramic and hybrid ceramic occlusal veneer restorations; the fracture force of all ceramic is better than hybrid ceramic.

Materials and Method

The materials were used are: IPS e.max CAD ceramic blocks; low translucency, shade A2 and size C14 (Ivoclar Vivadent/Italy), VITA ENAMIC Innovative ceramic blocks; low translucency, shade 2M2 and size C14 (VITA Zahnfabrik spitalgasse3 D-79713 Bad Säckingen Germany),and RelyX™ Ultimate adhesive dual cured resin cement (3MESPE, Seefled, Germany).

Sample Size Calculation for fracture force test: A sample size of 15 samples in each group was determined to provide 80% power for independent samples T test at the level of 0.05 significance using G Power 3.19.2

software. So we made our study on 15 samples for each material (5 samples for each thickness). (Figure 1)

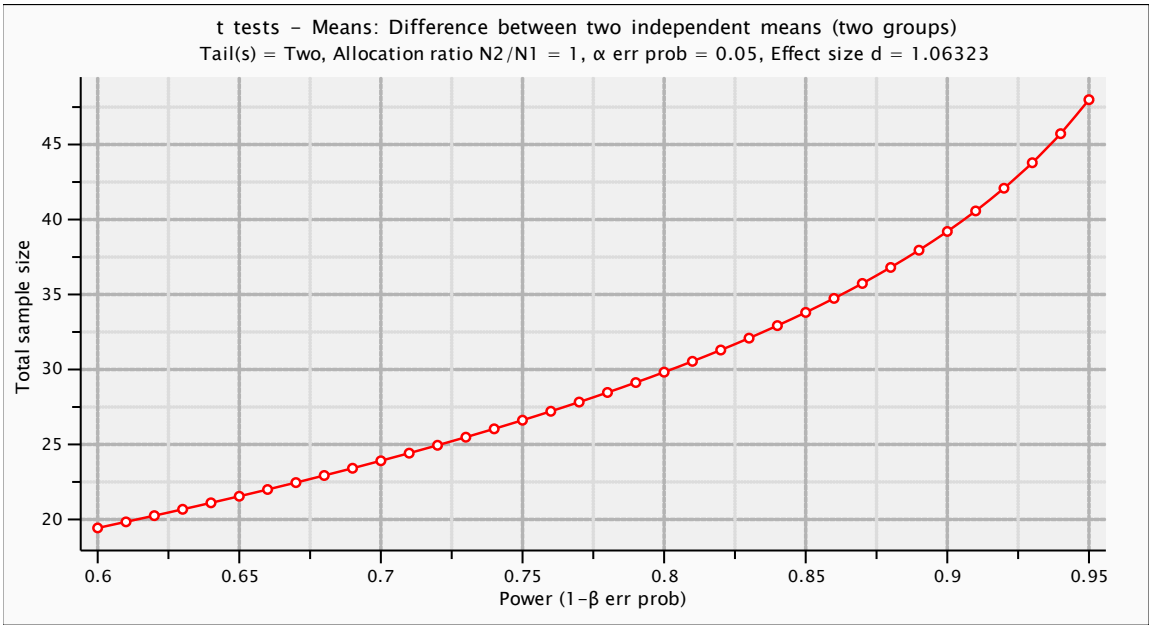

Figure (1)

Maxillary molar teeth with occlusal dimension average size (6mm x 5mm) were collected from the outpatient clinics of faculty of Dentistry Minia University. Teeth were freshly extracted, free from caries, restorations and fracture. The teeth were ultrasonically cleaned (Coltene Whaledent, Biosonic UC50 Ultrasonic, USA)of any surface debris then they were ready for use for samples construction.

Proper powder/liquid ratio of self-curing acrylic resin (cold cure acrylic resin, Acrostone, Egypt) was mixed according to the manufacturer's instructions. As it reached the dough stage, it was poured into customade split Teflon mold with (2.5cm diameter x 2.5cm height). The roots of the tooth were inserted into the center of the mold till 2 mm apical to the cement enamel junction. With the use of customade paralleling device (Egypt), to centralize the tooth in the mold. The excess of the acrylic resin was rapidly removed with metallic wax carver (Miltex. Stainless steel. pakistan**).** After complete polymerization of acrylic resin, the split Teflon mold was removed. The samples were subjected to uniform occlusal reduction with diamond cutting tools (Komet Dental. Gabr. B raseler GmbH & Co.KG Trophagener Weg 25.32657 Lemgo. Germany.) to produce a uniform preparation. Before preparation, condensation silicone rubber base (Speedix putty Ivoclar Vivadent, Liechtenstein) indices were made for tooth to aid in standardization of preparation thickness Silicone indices made by hand mixing of putty paste with catalyst according to manufacturer's instructions and loaded into a custom made metallic perforated tray. After impression setting, the index was removed[12].

The molar teeth were prepared manually using diamond cutting stones size 14 with high speed handpiece (W & H Dental Work, Burmoos, Austria) under water cooling. The occlusal surface reduction was 0.3 & 0.6 & 1.0 mm at the central fossa[19].

The preparations resulted were flat occlusal reduction without finish line (butt joint preparation). The three different preparation thicknesses were checked using a digital caliper (Miltex, stainless steel, Pakistan) with the silicon guide on the preparation**.**Epoxy resin dies construction; by the use of custom made perforated tray that has an internal diameter of 20 mm and 25 mm height[24].

Thirty impressions of prepared teeth were made using condensation silicone rubber base impression material (Speedix, Ivoclar VivaDent, Liechtenstein) by hand mixing according to manufacturer's instrucitons. The impression was loaded into the tray, prepared tooth was embedded in the impression and after setting the tooth was removed. The impression was poured by epoxy resin (kemapoxy 150, CMB, Egypt). The method

was repeated to create sixty epoxy dies. One size of epoxy paste and 1.5 size of activator were mixed under vibration (Vibromaster Bego Bremer, GmBA, Germany) for two minutes then it was leaved ten minutes before pouring to become homogenous mixture. The mixture was poured into the impression and leaved to set for 48 hours in order to reach complete setting and dimensional stability. The dies were removed from impressions, then was finished by low speed straight hand piece (Sirona Dental systems GmbH Fabrikstra Be 31 64625 Benesheim Germany)and polished by pumice (Dental Lab Pumice, Dentsply, USA) with smooth electronic brush (Miltex. Stainless steel. Pakistan).

Occlusal surfaces were surface roughened by low speed wheel stone (Komet Dental. Gabr. B raseler GmbH & Co.KG Trophagener Weg 25.32657 Lemgo. Germany) and it was ready for occlusal veneers construction (figure2).

Figure (2): Epoxy die

Designing, milling and crystallization of occlusal veneers;all occlusal veneers (IPS e.max CAD & VITA ENAMIC) were fabricated according to the direction of manufacturing companies for each fabrication system. Epoxy dies were scanned sequentially with camera system without powder (Cerec Omnicam 4.4.4 by Dentsply Sirona).Designing of all occlusal veneers were carried out using a standard protocol, on the computer software.

The thickness of occlusal veneers was 0.3 mm, 0.6 mm and 1.0 mm.

The integrity of the structure was visually checked before crystallization. The IPS e.max ceramic occlusal veneers were placed into the oven (programat P310 by ivoclar vivadent) for crystallization. At the end, the veneers were removed from the oven when it reached at room temperature. (Figure 3)

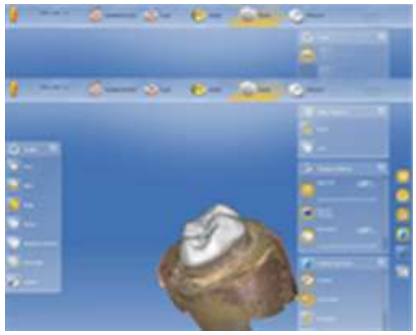

Figure (3) Visual veneer in position

Cementation of the occlusal veneers to the corresponding epoxy resin dies; occlusal veneers were etched using hydrofluoric acid gel 9.5% (*BISCO-Schaumburg U.S.A*) for 60 seconds, for VITA ENAMIC and 90 seconds, for IPS e.max CAD according to manufacturer instructions. After etching, the veneers were washed with water and dried using air spray (dental chair Roson. China). Then, veneers were brushed by silane coupling agent (BISCO-Schaumburg U.S.A) and wait for 30 seconds then it was dried with air syringe according to manufacturer instructions. Epoxy dies were left clean dry; bonding agent (Adper Single Bond 3M ESPE U.S.A) was brushed to the epoxy dies and light cured (Denjoy, China) for 20 seconds.

RelyX-Ultimate dual cured resin cement clicker was used. One click applied on the veneer and applied on the die and loaded by the loading device 6 N load □[9]□

Under load, the excess was removed then curing of the samples for 40 seconds.

After complete cementation of all occlusal veneers, the samples were ready for the tests. (Figure 4)

Figure (4) sample after cementation

Thermocycling procedures :- In this study the number of cycles used was 1000 cycles representing nearly 2years clinically. Dwell times were 25s in each water bath (Robota automated thermal cycle; BILGE, Turkey) with a lag time 10s. The low-temperature point was 5°C. The high temperature point was 55°C.

Fracture Force Test: According to manufacturer instructions,samples were secured to the lower fixed compartment of testing machine by tightening screws. Fracture test was done by compressive mode of load applied occlusally using a metallic rod with spherical tip (5.6 mm diameter) attached to the upper movable compartment of testing machine (Model 3345; Instron Industrial Product, Norwood, MA, USA) travelling at cross-head speed of 1mm/min. The load at failure manifested by an audible crack and confirmed by a sharp drop at load-deflection curve recorded using computer software (Bluehill Lite Software Instron Instruments). The load required to fracture was recorded in Newton.

Results

There was no significant difference in the fracture force between the two materials regardless the thickness. There was significant diffirence between different thicknesses regardless the material type. There was no significant difference between the two materials at thickness of 0.3mm. In the group with 0.6 and 1mm mm thicknesses, there was a significant difference and IPSe.max CAD had higher strength than VITA Enamic. The fracture strength increases with the increase of the thickness in both materials.

1. Fracture force measurement:

Table 1: Effect of material, thickness and interaction between both on Fracture force

Fracture Force	F	P Value
Material	12.89	0.001*
Thickness	92.98	<0.001*
Material * Thickness	1.49	0.245

Two-ways-ANOVA test, *: Significant level at P value < 0.05

Table 2: Comparison of fracture force between the two materials regardless the thickness

		Material		P value
		E-max	Vita Enamic	
		N=15	N=15	
Fracture force	Range	(632.5-2310)	(547.3-1723)	0.272
	Mean ± SD	1329.5±552.9	1096.5±418.3	
	Median	1292.5	1049	

Mann Whitney test for non-parametric quantitative data (expressed as median) between the two groups, Significant level at P value < 0.05

Table 3: Comparison of fracture force between the different thicknesses regardless the Material type

		Thickness			P value
		0.3 mm	0.6 mm	1 mm	
		N=10	N=10	N=10	
Fracture force	Range	(547.3-846)c	(820-1393.8)b	(1410-2310)a	<0.001*
	Mean ± SD	706.5±93.3	1147.8±188.1	1784.8±309.7	

One-way ANOVA test for parametric quantitative data between the three groups followed by post hoc analysis between each two groups, Superscripts with different small letters refer to a significant difference between each two groups, *: Significant level at P value < 0.05

Discussion

Egbert J S, et al (2015) stated that in case of patient with severly worn dentition, CAD/CAM occlusal veneer restoration made of hybrid ceramic is an alternative to full coverage restorations. The failure load of teeth restored with full coverage with 1.5- 2.00 mm was to be 771-1183 N[3], that is lower than this study (1727-2415). This fracture strength was reported to be higher than human masticatory forces (585-880) **Kikuchi M et al, 1997.**

In accordance to **Chen C, et al (2014)**reported that with increase the thickness of IPS e.max CAD, the fracture resistance increased. There is no change between 0.5 mm and 1.5 mm thickness but sharp increase occurred at

2.0 mm. Tha normal occlusal load is 100 N-200 N in the molar area and 965 in accidental bite. 1000 N is required for clinical longivety. This requirement was achieved in the test specimens of Chen et al, 2014 and also at 0.5 mmor 1.0 mm thickness.[4 & 5 & 6].

Stawarczyk B et al (2016)reported that the fatigue resistance of occlusal veneers was increased by CAD/CAM composite in comparison with lithium disilicate ceramics (schlichting et al., 2011). Results of their study (stawarczyk) CAD/CAM revealed higher flexural strength than VITA Enamic, but lower than lithium disilicte ceramic.

Hamburger J T, et al (2014): Using a total-etch adhesive system improved the resistance to fracture[7]. Normal occlusal forces are 50-300 N and reaches to 1200 N in case of clenching[8]. E.max CAD showed minimal occlusal thickness 1.5 mm. In the study of **Hamburger J T, et al;** Direct composite restorations give good properties at high occlusal load.

The hypothesis of this study was partially rejected that there was no significant difference between IPS e.max and VITA Enamic materials in fracture force test but there was a significant difference between the two materials at 0.6 mm thickness.

Conclusion

Within the limitation of this study:

1. IPS e.max CAD and VITA Enamic are clinically applicable for occlusal veneer restorations and they are closer to each other in the fracture force.
2. Thickness has great effect on the restoration force, as with increase of the thickness the force increases.
3. Thin thickness as 0.3 has questionable survival in the oral environment. In case of patients with bruxism, it is advised to use restoration thickness not less than 0.5 mm.
4. Occlusal veneer restorations are advised to be used as a conservative approach and accepted force.

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The Analysis of the Dynamics of the Willingness-to-Pay Indicator for the Use of Innovative Technologies in Healthcare Calculated on the Basis of the Purchasing Power Parity of the Population in the Post-Soviet Countries

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Abstract

Objective: To conduct a comparative analysis of the dynamics of changes in the willingness-to-pay (WTP) indicators concerning introduction of the innovative technology in the healthcare systems of the post-Soviet countries.

Materials and Method: The studies used the "Willingness-to-pay" calculation method proposed by the WHO Commission on Health Macroeconomics and Economics. Calculation of willingness-to-pay indicators in the reference countries was carried out on the basis of the purchasing power parity (PPP) of the population.

Results: In the group of reference countries a wide range of average values of the willingness-to-pay indicators was characteristic. Thus, it ranged from 7,7 USD Thousand in Tajikistan to до 72,54 USD Thousand in Russia. The systematic growth rate of the willingness-to-pay indicators was observed in 5 out of 12 reference countries (Armenia, Georgia, Kyrgyzstan, Turkmenistan, and Uzbekistan). Most countries, namely 8 out of 12, can be attributed to the group of countries with the average (from 25,0 to 50,0 USD Thousand) and low (up to 25,0 USD Thousand) WTP values. It significantly reduces the potential of national healthcare systems in introducing innovative technologies in practical medicine. The fact that in all countries the average growth rate is positive (from 101.0% in Belarus to 109.0% in Turkmenistan) is promising.

Conclusion: As a result of the research significant differences in the willingness-to-pay indicators in the reference countries have been found. This problem requires a systematic solution in the post-Soviet countries, primarily in order to increase the availability of innovative drugs for socially disadvantaged groups of patients.

Keywords: *Innovative drug, innovative health technology, health technology assessment, pharmaceutical provision of the population, willingness-to-pay indicator.*

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Introduction

The active development of innovative approaches in elaboration and promotion of new advanced drugs to the pharmaceutical market significantly expand the current opportunities for the treatment of many diseases that have long been considered incurable.[1-3] Currently it is difficult to imagine at least one area of medicine, which would not use high-tech innovative drugs.[4-5] It is difficult

to overestimate the modern role of innovative drugs in the pharmacotherapy of cancer pathologies, orphan diseases, etc.[6-8] On the way of active implementation of innovative health technologies, which include the use of pharmacotherapy regimens with high-cost innovative drugs, in practical medicine many national healthcare systems are faced with the problem of resource shortage for their use.[5,8-10] The application of direct method of price regulation for innovative drugs do not always allow to achieve the desired result, i.e. to increase the availability of using these drugs.[11-12] Implementation of Health Technology Assessment (HTA) methodology allows us to effectively assess the resource potential of national healthcare systems for the introduction of innovative technologies.[13-15] HTA uses a range of tools, among them determination of the willingness-to-pay indicator (willingness-to-pay analysis – WTP) of the state and society as a whole for the use of innovative drugs in various fields of practical medicine is becoming increasingly important.[16-18] This indicator was first determined in the 80s of the last century in the United States and Canada (Kaplan RM, Bush JW).[19] The indicator determines all costs of the society in monetary form in preservation of one year of additional quality life (quality adjusted life years – QALY) of a patient with renal insufficiency who is on hemodialysis.[19-20] The determination and use of the WTP indicator analysis data is of particular relevance for countries that are at the stages of reforming national healthcare systems in the direction of constructing rational models of public service.[21-24] Countries of the former Soviet Union with full responsibility can be attributed to such countries.[21] The aforesaid facts determined the aim of our research, namely to perform a comparative analysis of the dynamics of changes in the WTP indicators in the post-Soviet countries.

Materials and Method

The object of our research was the data of the World Bank for Reconstruction and Development reflecting the main macroeconomic and demographic indicators of the post-Soviet countries for 2010-2017. In addition, the data presented on the official websites of the relevant ministries and departments of the reference countries were used. When determining WTP the method proposed by the WHO Commission on Health Macroeconomics and Economics was used.[15,21,25] This method is recommended for macroeconomic calculations and the appropriate analysis of the WTP indicators.[15,16,21] Thus, to determine the WTP indicator the country's GDP data calculated per capita and multiplied by three are used. This method has a number of limitations within the application of a particular health technology.[15,16.21,25] However, the relative simplicity of this method allows it to be used for the preliminary analysis of the resource potential of the society for the introduction of innovative medical technologies, including in developing countries.[15,16.21,26] The GDP data calculated by the Purchasing Power Parity (PPP) indicator expressed in international dollars were used in the studies.[27,28] Intermediate indicators for the WTP calculation are presented in Table 1.

Table 1: The GDP per capita calculated by the Purchasing Power Parity indicator of the population for 2010-2017

Country	2010	2011	2012	2013	2014	2015	2016	2017	Average Value
GDP Calculated by PPP, USD Thousand									
Azerbaijan	15,63	15,75	16,18	17,17	17,61	17,82	17,28	17,53	16,87
Armenia	6,57	7,02	7,65	8,00	8,40	8,74	8,85	9,48	8,09
Belarus	15,91	17,17	17,80	18,27	18,90	18,38	18,09	17,84	17,80
Georgia	6,60	7,32	8,03	8,54	9,22	9,63	10,02	10,74	8,76
Kazakhstan	19,69	21,28	22,39	23,77	24,85	25,10	25,33	24,40	23,35
Kyrgyzstan	2,73	2,92	2,92	3,23	3,35	3,45	3,56	3,70	3,22
Moldova	3,83	4,18	4,23	4,70	5,02	5,06	5,34	5,19	4,70
Russian Federation	20,50	24,07	25,32	25,48	25,47	23,70	23,16	25,74	24,18
Tajikistan	2,06	2,21	2,37	2,53	2,68	2,82	2,99	2,88	2,57
Turkmenistan	9,74	11,21	12,47	13,72	15,14	16,00	16,94	18,16	14,17
Uzbekistan	4,15	4,47	4,85	5,24	5,66	6,08	6,53	6,72	5,46
Ukraine	7,67	8,28	8,48	8,63	8,68	7,95	8,27	8,75	8,34

Such research method as historical, system, logical, comparative, graphic, mathematical and statistical, content analysis, as well as method of logical modeling were used. Both a comparative analysis of the average values of WTP calculated by PPP in the reference countries, and the analysis of changes in the WTP indicators in the dynamics of years (2010-2017) were conducted. In the analysis of the dynamics of indicators the chain growth and the growth rate (%) of indicators, as well as the chain coefficients (k) of the growth/decline rate, were applied. In the analysis all reference countries were divided by the average WTP indicators into three groups with equal value intervals. The first group of countries "A" included countries with an average value of the WTP indicator from 50,0 to 75,0 USD Thousand. The second group "B" were countries with the WTP indicator, which ranged from 25,0 to 50,0 USD Thousand, and the third group "C" – below 25,0 USD Thousand. The statistical data processing was carried out using the statistical package StatSoft. Inc. (2014), STATISTICA version 12.0 and Excel spreadsheet. After the preliminary assessment of the data all indicators were imported into a Statistica 6.0 standard program for the applied statistical analysis. The p-value <0.05 was considered statistically significant.

Results And Discussion

Our studies demonstrated the following results. In the post-Soviet space, the WTP indicator calculated by PPP for 2010-2017 fluctuated in a wide range of values. Thus, the minimum value was typical in Tajikistan in 2010 (6,19 USD Thousand), and the maximum in Russia in 2017 (77,22 USD Thousand) (Tab. 2). The most important positive characteristic of the dynamics of the WTP indicators for countries was its systematic increase in most countries. Thus, the annual increase with different growth rates was typical for Armenia, Georgia, Kyrgyzstan, Turkmenistan and Uzbekistan. These countries showed a stable growth of the WTP indicator. In countries, such as Azerbaijan (2016), Kazakhstan (2017), Moldova (2017), Tajikistan (2017) and Ukraine (2015), the WTP reduction in relation to the data of the previous year was observed only once in a dynamics of indicators. In Russia, the WTP indicator was negative the growth dynamics in 2015 and 2016 compared to the data of the previous year, and in Belarus there was the negative dynamics for three consecutive years (from 2015 to 2017). Further, the average WTP indicators in the countries, as well as their average values of the chain growth rates during 2010-2017 were calculated. The results of the research are presented in Fig. 1 and 2. As can be seen, Russia is the undisputed leader by the WTP indicator, while the lowest value is observed in Tajikistan.

Table 2: Analysis of the dynamics of change in the WTP indicators calculated by PPP in the group of reference countries

Country	Unit of measurement	WPT and the growth rate within the research years							
		2010	2011	2012	2013	2014	2015	2016	2017
Azerbaijan	USD Thousand	46,86	47,25	48,54	51,51	52,83	53,46	51,84	52,59
	%	–	1.01	1.02	1.06	1.03	1.01	0.97	1.01
Armenia	USD Thousand	19,70	21,07	22,95	23,99	25,19	26,23	26,55	28,44
	%	–	1.07	1.09	1.05	1.05	1.04	1.01	1.07
Belarus	USD Thousand	47,72	51,50	53,41	54,82	56,71	55,15	54,27	53,52
	%	–	1.08	1.04	1.03	1.03	0.97	0.98	0.97
Georgia	USD Thousand	19,80	21,95	24,08	25,63	27,65	28,89	30,07	32,22
	%	–	1.11	1.10	1.06	1.08	1.05	1.04	1.07
Kazakhstan	USD Thousand	59,07	63,83	67,18	71,32	74,53	75,29	76,00	73,20
	%	–	1.08	1.05	1.06	1.05	1.01	1.01	0.96
Kyrgyzstan	USD Thousand	8,20	8,76	8,77	9,69	10,05	10,36	10,67	11,1
	%	–	1.07	1.00	1.10	1.04	1.03	1.03	1.04
Moldova	USD Thousand	11,50	12,54	12,68	14,10	15,05	15,19	16,03	15,57
	%	–	1.09	1.01	1.11	1.07	1.01	1.06	0.97

Country	Unit of measurement	WPT and the growth rate within the research years							
		2010	2011	2012	2013	2014	2015	2016	2017
Russian Federation	USD Thousand	61,49	72,22	75,95	76,44	76,43	71,11	69,49	77,22
	%	–	1.18	1.05	1.01	1.00	0.93	0.98	1.11
Tajikistan	USD Thousand	6,19	6,64	7,10	7,58	8,05	8,45	8,96	8,64
	%	–	1.07	1.07	1.07	1.06	1.05	1.06	0.96
Turkmenistan	USD Thousand	29,22	33,63	37,41	41,16	45,42	48,00	50,82	54,48
	%	–	1.15	1.11	1.10	1.10	1.06	1.06	1.07
Uzbekistan	USD Thousand	12,46	13,41	14,56	15,73	16,97	18,25	19,58	20,16
	%	–	1.08	1.09	1.08	1.08	1.08	1.07	1.03
Ukraine	USD Thousand	23,00	24,85	25,43	25,89	26,05	23,84	24,82	26,25
	%	–	1.08	1.02	1.02	1.01	0.92	1.04	1.06

The WTP indicator variation range in the countries was 64.84 USD Thousand. Thus, in Tajikistan this figure was 8.5 times less than in Russia. The fact that in all CIS countries the average chain growth rate had only positive values is promising (Fig. 2). In ascending order of this indicator the countries were distribute as follows: Belarus; Ukraine and Azerbaijan; Kazakhstan; Russia and Kyrgyzstan; Moldova and Tajikistan; Armenia; Uzbekistan and Georgia; Turkmenistan. Therefore, the best indicators of the dynamics of growth rates were demonstrated by Turkmenistan, while Belarus had the worst indicators.

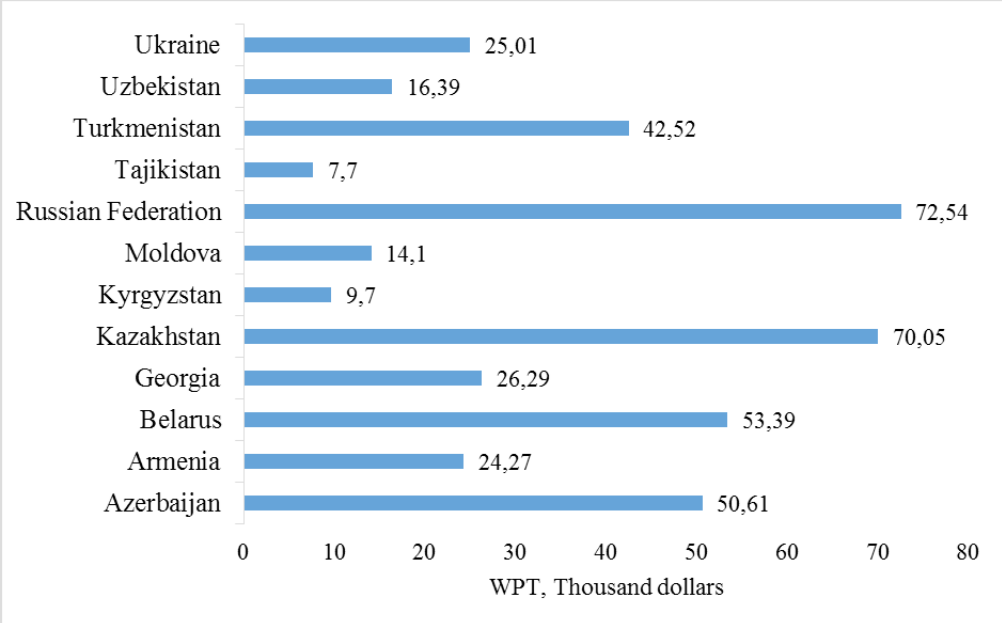

Fig. 1: Analysis of the average WTP indicators in post-Soviet states (within 2010-2017)

When dividing countries into groups by the average value of the WTP indicator the following results were obtained:

- 4 countries of group "A" – Russia, Kazakhstan, Azerbaijan, Belarus;
- 3 countries of group "B" – Turkmenistan, Georgia, Ukraine;
- 5 countries of group "C" – Armenia, Uzbekistan, Moldova, Kyrgyzstan and Tajikistan.

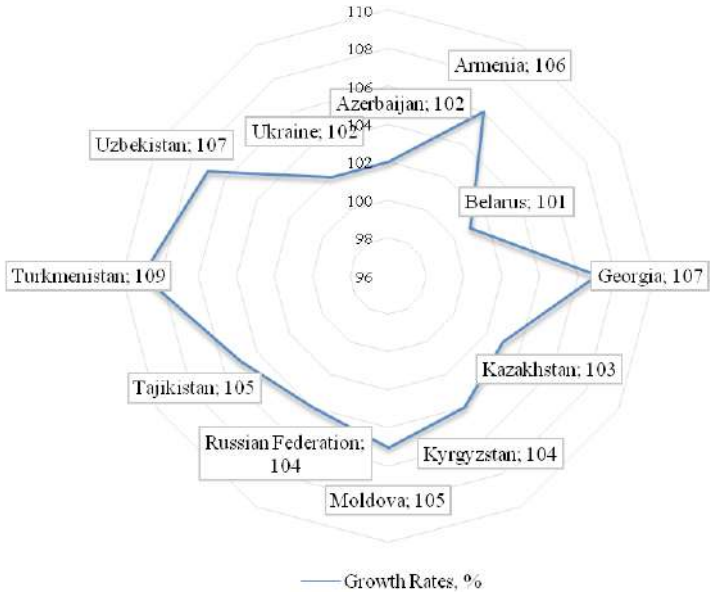

Fig. 2: Analysis of the average WTP indicators in post-Soviet states (within 2010-2017)

As can be seen, most reference countries, namely 8 out of 12, can be attributed to the group of countries with the average (from 25,0 to 50,0 USD Thousand) and low (up to 25,0 USD Thousand) WTP values. It significantly reduces the potential of national healthcare systems in introducing innovative technologies in practical medicine. Therefore, many expensive innovative drugs may remain inaccessible to different groups of patients in these countries in the near future.[21,29,30]

Conclusion

Systematizing data of the studies conducted the following conclusions can be made. Despite the historical commonality of the development of the reference countries that were part of the former USSR, as well as the active actions of the governments of these countries in the direction of reforming national healthcare systems, the availability of innovative technologies in practical medicine for many patients remains problematic. The solution of this problem is in the expansion of state guarantees for socially disadvantaged groups of patients against the background of the gradual introduction of new forms and method of financing of practical healthcare, for example, due to the implementation of complementary health insurance programs or microinsurance.

Ethical Clearance: Taken from Bioethics Commission of the National University of Pharmacy (Kharkiv, Ukraine).

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Molecular detection of *C5a* Peptidase (*scp*B) Gene in Group B Streptococcus Isolated from Pregnant Women and the Correspondence with Adverse Pregnancy Outcome

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Abstract

Group B *Streptococcus* is Gram-positive cocci non motile encapsulated bacteria which produce an arrow zone of beta-hemolysis on blood agar. It belongs to Lancefield group B antigen. Group B *Streptococcus* is the mainly cause of neonate's invasive bacterial disease such as neonatal sepsis meningitis, septicemia and pneumonia. The study planned to evaluate the vaginal colonization rate of *Streptococcus agalactiae* and virulence genes in pregnant women with adverse pregnancy outcome. A cross-sectional study was designed included 200 pregnant women at 34–37 weeks of gestation. A total of two hundred vaginal swabs was taken from all pregnant women enrolled in this project by the gynecologist. GBS isolated bacteria was evaluated by means of using classical microbiological approach, after DNA extraction the isolated GBS strains were screened for the presence of *scpB* gene by polymerase chain reaction. Thirty-six (18%) out of 200 pregnant women enrolled in this project were positive for group B *Streptococcus* by culture method, the majority of them were from age ranged (18-36 years), 20 (20.6%) of them with a history of abortion, females with positive vaginal colonization indicated that they had a history of rupture membrane only in 10 (9.9%) with prolonged rupture membrane >18hr in 3 (30%).The specific PCR primer was used for the detection of *scpB* gene. It was found that *scpB* gene was observed in 17 (47%) isolate.It can be conclude that there is no statistical significance between repeated abortions with the presence of *scpB*gene as a virulence factor in GBS while there are statistically significant between the presences of these virulence gene with rupture membrane.

Keywords: *Group B streptococcus, Streptococcus agalactiae, Premature rupture of membrane (PROM), Maternal colonization.*

Introduction

Streptococcus agalactiae or group B streptococcus (GBS) are members of normal flora in human genitourinary and gastrointestinal systems. GBS is the main agent for serious infections such as meningitis in newborns, asymptomatic bacteriuria, urinary system infections, cystitis, pyelonephritis, chorioamnionitis, postpartum endometritis, pre and postpartum bacteremia, and post-cesarean wound infections in pregnant women[(1)]. The colonization of GBS in the urogenital or gastrointestinal system of the mother is the most important risk factor for the development of invasive newborn disease [(2)]. When no precaution is taken, early-onset GBS infections develop in 1–2% of the infants of women with GBS colonization, usually in the first days of life, which often progresses to fulminant disease. The majority of GBS infections are early-onset infections and can be prevented with intra-partum antibiotic prophylaxis [(3,4)].Revised CDC guidelines for the prevention of early-onset GBS disease (2010) recommend universal culture-based screening of all pregnant women at 35th and 37th weeks of pregnancy to identify those who should receive prophylactic intrapartum antibiotic treatment[(5)]. Although the CDC guidelines indicate culture as the gold standard method for GBS detection, these same guidelines include

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expanded laboratory method for detecting this organism. In particular, polymerase chain reaction (PCR)-based assays comprise an additional option for the rapid detection of GBS colonization[5,6]. The goals of this investigation were to study the vaginal colonization rate of Streptococcus agalactiae in pregnant women with adverse pregnancy outcome.

Subjects and Method

A cross-sectional study was designed included 200 pregnant women at 34–37 weeks of gestation, all females were examined clinically by the gynecologist. Data information was collected from each participate in this study included; age, previous abortions, a history of premature rupture of membrane (PROM), premature labor and neonatal anomalies.

Vaginal swabs have been accumulated from pregnant ladies attending the antenatal clinic of AL-Imammian AL-Kadhmain teaching hospital. Baghdad, Iraq. During the period from February to October 2018. The age of patients ranged from 15 to 45 years. Exclusion criteria include; pregnant women who were on antibiotic treatment two weeks prior to recruitment, women with vaginal bleeding and pregnant women with UTI. The current research authorized by the ethical Committee College of Medicine Al-Nahrain University and it's conducted in the department of the medical Microbiology College of Medicine Al-Nahrain University.

Specimens Collection and Processing: A total of two hundred samples, including 200 vaginal was taken from all pregnant women enrolled in this project by the gynecologist. Swabs from each patient were directly inoculated in Todd-Hewitt broth media containing 10 µg/ml colistin and 15 µg/ml nalidixic acid, and aerobically incubated at 37°C overnight.

GBS isolated bacteria was evaluated by means of using classical microbiological approach, which included used by Todd-Hewitt broth as an enrichment and selective media for group B streptococcus then subcultured on blood agar to select the appropriate colony, Then, the plates were inspected and identified for GBS organisms by the following criteria: colonies with narrow zone of beta hemolysis, Gram-positive cocci, catalase negative, resistance to bacitracin, sodium hippurate hydrolysis-positive.

DNA extraction and polymerase chain reaction assay

DNA extracted by using presto TM mini g DNA, bacterial kit Geneaid Company.

The primers and PCR conditions used to amplify gene encoding virulence factors with PCR are listed in Table (1).

Table (1): The primers sequence for *scpB* and PCR program conditions[7]

Gene	Primer sequence (5′-3′)	Size (bp)	PCR condition
*scpB*gene	5'-ACAATGGAAGGCTCTACTGTTC-3' 5'-ACCTGGTGTTTGACCTGAACTA-3'	255	94°C 3 min 1 Cycle 94°C 45 sec 57°C 45 sec 72°C 1min 33 Cycle 72°C 7 min 1 Cycle

Statistical Analysis: Quantitative variables were expressed as a mean± standard deviation (SD) while binomial variables were expressed as frequency and percentage and analyzed by Chi-squared test whenever possible. The statistically significant was set at *P value* ≤0.05.

Result

Distribution of streptococcal colonization according to the age of Patients and maternal medical history: Two hundred pregnant female were recruited in this study after meeting the inclusion criteria with age ranged from (15-39 years). Results of vaginal colonization showed the majority were from age ranged (18-36 years), 20 (20.6%) of them with a history of abortion, females with positive vaginal colonization indicated that they had a history of rupture membrane only in 10 (9.9%) with prolonged rupture membrane >18hr in 3(30%). Table (2).

Table (2): Frequency distribution of vaginal colonization according age and Maternal Medical history.

		Vaginal colonization		P. value
		Positive	Negative	
Age (Mean) Yrs. Range (15 – 39 Yrs) Std. Deviation		26.11 (18-36 yrs) 4.646	27.49 (15 - 39 yrs) 4.940	
History of abortion	With	20 (20.6%)	77 (79.4%)	0.350
	Without	16 (15.5%)	87 (84.5%)	
History of rupture membrane	With	10 (9.9%)	91(90.1%)	0.003
	Without	26 (26.3%)	73 (73.3%)	
Prolonged rupture membrane	>18hr	3	23	
	<18hr	7	68	

Molecular identification of *C5a* Peptidase (*scp* B) gene: PCR based to the C5a Peptidase (scpB) gene, revealed that out of 36 bacterial isolates by culture dependent method, *scpB* gene was detected in 17(47%) with (255 bp) amplification fragment. Figure (1).

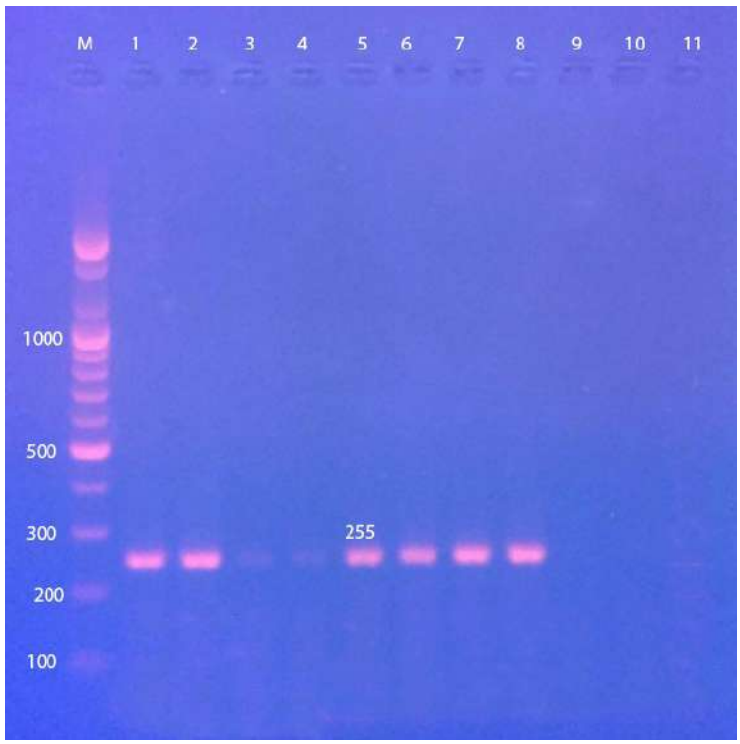

Figure (1): 2% Agarose gel electrophoresis at 70 volt for 30 min for *scpB* PCR products visualized under U.V light at 280 nm after staining with ethidium bromide. L: 1500 bp ladder; lane (1 - 8) were positive for this gene, the size of product is 255 bp.

The relation between *scpB* Gene with maternal outcomes: There are 17(47%) patients with positive result for *scpB* gene, in those patients there are 11 (11.3%) from all patients presented with abortion, with no statistical significant p value <0.05 (0.162), the most common maternal outcomes reported in current study in association with *scpB* gene positivity were rapture of membrane *p* value (0.001) (Table 3).

Table (3): The relationships between *scpB* gene with maternal outcomes

	scpB gene		P. value	Odds ratio
	Positive	Negative		
With abortion	11 (11.3%)	86 (88.7%)	0.162	2.068
Without abortion	6 (5.8%)	97 (94.2%)		
Rapture mem	2 (2%)	99 (98%)	0.001	0.113
Non-rapture	15 (15.2%)	84 (84.8%)		

Discussion

Based on data obtained from current study, the prevalence of group B streptococcus among pregnant women was 36 (18%) out of 200 samples, This remark disagreement with a observe executed in Iraq by Taiseer*et al*.[8] who found that (10%) of pregnant women were positive for vaginal colonization, another study conducted by Hamid *et al*.[9] stated that carriers of group B streptococci in pregnant women was (24.3%). However, a study conducted in Turkey by Alp *et al*.[10] Reported that colonization rate for GBS was (9.8%) out of 215 pregnant women.

This discrepancy in such outcomes, can be attributed to the difference in the number of specimens in each study, methodology used such as the way of taking samples from vaginal mucosa, timing of swab, presence of an intrauterine device and the types of transport media in each study, ultimately affect the cultivation of GBS, in addition to the exclusions and inclusions criteria which differ from study to another.Current investigation reported that, there was no statistically significant relationship between GBS carriage with age and history of abortion. Such results similar to Karadag *et al*.[11]. This study identified GBS colonization in 10 (9.9%) women who had Premature rupture of membrane (PROM) demonstrating a statistically significant relationship between GBS positivity and history of PROM. This result comes compatible with study by Alp F and Findik[10].

Premature rupture of membrane (PROM) one of the most culprit in maternal morbidity and mortality and also lead to fetal death as a result to sepsis, asphyxia, and pulmonary hyperplasia [12]. Many studies have indicated a close relationship between Women with intrauterine bacterial infection such as GBS with rupture of membrane and infants born for those women have a mortality rate four times higher than those without[13,14].

Detection of C5a Peptidase Virulence Gene by PCR: Data in this study reported that scpB gene was detected in 17 (47%) out of 36 bacterial isolates. this result contradicted with recent study conducted in Iraqi by Tiasire*et al*.[8] and in Argentina by Laczeski who stated that scpB gene were present in percentage of (100%) [15]. While Shabayek *et al*., reported scpBgene found in 30% [16].It is important to note that discrimination in such results may be due to regional or strain variations which affect gene expressions or as a result of mutations in such gene. Reichenberger *et al*., reported that bacterial mutations may occur spontaneous, or induced by a mutagen in the environment .However, it has also been hypothesized that bacteria might probably able to selectively increase mutation rates when they are presented to certain "stressful" or growth-limiting condition, it conceivable to demonstrate that ecological elements drive changes in nucleotide content, not only between highly diverged environment types, but also between specimens obtained from the distinctive human[17].

Relationship between C5a Peptidase gene of GBS and pregnancy outcomes: Our data demonstrated that there are no correlations between repeated abortions with the presence of C5a peptidase gene as a virulence factor in GBS, while there are statistically significant correlations between the presences of this virulence gene with membrane rupture. In relations with infection, an examination of PROM principally centered on the catabolic degradation of collagen mediated by matrix metalloproteinases (MMP) with certain investigations of different pathways including apoptosis and oxidative stress [18].

Inflammation of the chorioamnion and within the amniotic fluid is thought to assume a critical role in the pathogenesis of premature rupture untimely in preterm delivery. Infection-related preterm labor is commonly characterized by raised amniotic fluid cytokine levels in

pregnant [19]. Vanderhoeven *et al*., 2014 hypothesized that premature membrane rupture may be due to ascending infection during pregnancy that may increase risks of chorioamnionitis, in addition to mediating inflammation, cytokines have additionally been related with increased collagen remodeling and, ultimately, biophysical weakening of the fetal membranes or chorioamnion in vitro[20]. Data in current study, in harmony with a study by Surve*et al*., (2016) who demonstrated in a rat model that, GBS produces membrane vesicles, which lead to chorioamnionitis and damage to the rupture of membranes as a results to significant elevations of amniotic fluid cytokines (TNF-α, IL-8, IL-1β, IL-6) that stimulated by virulence factors of GBS [21].

Conclusion

Our data suggest that GBS highly prevalent among pregnant women, there was high degree of correspondence between vaginal carriage for GBS and Premature rupture of membrane (PROM)which is the must adverse pregnancy outcome associated with GBS carriage in this study.

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required.

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Relative Hypoxia in Immunized Mice Spleen Macrophages as Indicated by Hypoxia Inducible Factors, Cytoglobin and Peroxisome Proliferator Activated Receptor Gamma Coactivator (PGC)-1α

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Abstract

Introduction: Spleen is the largest lymphatic organ in the body that is responsible for initiating an immune response to antigens, consistof macrophages and lymphocytes. Macrophages are cells that engulf foreign bodies by migration, phagocytosis, O_2 burst, lysosomes fusion, synthesis and secretion of various cytokines which would require enormous amounts of energy. Therefore, macrophages needs of $O_2$to increase resulting in hypoxia relative. To overcome this situation, the cell is equipped with a special mechanism which is under the control of HIF. They are highly dependent to O_2existence to produce energy. This process is important for biochemical adaptation in homeostasis. Macrophages expressing Cygb for supplying O_2 and PGC-1 for mitochondrial biogenesis in producing energy. This study aims to determine whether the spleen macrophages in mice being immunized intraperitoneally with SRBC increase the expression of HIF, Cygb and PGC-1α.

Method: 24 male BALB/c mice, aged 2 months were immunized by injecting 0.2 ml SRBC 2%. Macrophages were taken from spleen of mice. Expression of mRNA and protein levels of HIF-1α, HIF-2α, Cygb, PGC-1α in macrophages were measured by real time RT-PCR and ELISA, respectively. Level of O_2burst were measured with WST Salts. Observations were made at 24, 48, and 72 hours post-immunization.

Results: The ability to oxidize antigen levels (O_2burst) found higher at 24 hours after immunization. The levels of protein and mRNA expression of HIF-1α and HIF-2α showed the highest increase at 24 and 48 hours after immunization. The levels of Cygb protein increased at 48 hours group after immunization while mRNA expression increased at 24 hours after immunization. PGC-1α protein levels decreased in 24 hours after immunization and then increased gradually.

Conclusion: This study shows the expression pattern of several proteins in spleen macrophages of mice that was immunized

Keywords: *Spleenmacrophages, HIF-1α, HIF-2α, Cytoglobin, PGC-1α, Immunization.*

Introduction

Spleen is the largest lymphatic organ in the body that is responsible for initiating an immune response to antigens that blood-borne antigen. Spleen is divided into two compartments; red pulp and white pulp. Both compartments contain a set of macrophages.(1,2) Macrophages are very important cells in immunity, innate as well as acquired immunity.(1) They join both immunities and undertake several activities which are high in energy cost. Moreover, macrophages have to oxidize the engulfed foreign bodies.(3) Each activity increases the oxygen (O_2) consumption and as the O_2 supply remains static, the macrophages should undergo

hypoxia condition. To prove it, 24 male BALB/c mice, aged 2 months were immunized intraperitoneally with Sheep Red Blood Cells (SRBC) as antigen and analyzed several factors involved in overcoming relative hypoxia, supply O_2 and energy. For this purpose, we measured Hypoxia Inducible Factors(HIF)-1α, HIF-2α, cytoglobin (Cygb) and Peroxisome proliferator-activated receptor (PPAR) gamma coactivator (PGC)-1α protein and mRNA levels. It is widely known that, HIFs are very important for cell survival in relative hypoxia,[4]and Cygb is assumed as intracellular O_2 binding protein[5] whereas PGC-1α is needed in biogenesis of mitochondria an indispensable organelle for ATP synthesis in energy supply.[6]We used the spleen macrophages due toit's role as the major secondary lymphoid organ in the body and practically all cells involved in immune response will pass and stay in the organ.[7] We studied spleen macrophages 24, 48, and 72 hours after SRBC immunization.

Materials and Method

Experimental animals used were 24 male BALB/c mice, weigh 20-25 grams, aged 2 months from Animal Laboratory Unit, Faculty of Veterinary Medicine, Bogor Agricultural University-IPB. Mice divided into 4 groups and each group consists of 6 mice: not immunization as a control group, 24 hours post immunization group, 48 hours post immunization group, 72 hours post immunization group. Immunization using SRBC 2% as antigen then undergo cervical dislocation. Whole spleen was taken and put in Phosphate Buffer Saline(PBS) pH 7.4. The Spleen chopped into small pieces and washed with PBS pH 7.4. Splenocytes were centrifuged at 3000 rpm for 30 minutes at 4°C. Red blood cells were removed using red blood cell lysis buffer and then washed with PBS. The pellet is suspended in PBS pH 7.4, centrifuged at 400xgfor 30 minutes at room temperature and macro phages are found at the bottom of the tube. The cells were washed again with PBS pH 7.4.

Oxygen burst activities measured with Water Soluble Tetrazolium Salt (WST) method. Macrophages were resuspended with 100 µL Roswell Park Memorial Institute (RPMI) medium and after several minutes followed by addition of Hank's Balanced Salt Solution (HBSS) 1 mL and finally 2 µL WST. Acquired macrophage cells then added HBSS and WST, incubated for 4 hours at 37°C, and wait until precipitated. The supernatant were measured using a spectrophotometer at450 nm.[8]

Total cellular RNA was extracted with Tripure isolation reagent (Roche) and used only 100 ng of total RNA for RT-PCR. Primer sequences for HIF-1α, HIF-2α, Cygb and β-actin for each mRNA (forward and reverse) are presented in table 1.

Table 1: Primer sequences of HIF-1α, HIF-2α, Cygb and β-actin

Primer	Forward	Reverse
HIF-1α[9]	[5'-GCA CTA GAC AAA GTT CAC CTG AGA-3 ']	[5'-CGC TAT CAT CAA CCA AGC AA-3']
HIF-2α[10]	[5'-CTC CTC GAG CAG AGG AAA TG-3']	[5'-CAG GTA AGG CGA CTC GAA TG-3']
Cygb[11]	[5'-CGC AGC CTA CAA GGA AGT G-3']	[5'-CCT GAA GGC GAG AGA GTG G-3']
β-actin[12]	[5'-CT GTG AAA ACC AGG CCA AG-3']	[5'-ACC AGA CAG GGA GGC ATA CA-3']

Reaction components are used based on a modification of the protocol in the kit iScript™ One Step RT-PCR with SYBR®Green. The threshold cycle (CT) was determined, and the relative gene expression was calculated with Livak Formula.[13]

Measurement of expression HIF-1α, HIF-2α, Cygb and PGC-1αprotein using Enzyme-linked immunosorbent assay(ELISA) kits from Elabscience. These ELISA assays were performed in accordance with the instruction of the respective manufacturers. Data analysis is performed using SPSS program version 20.0.

Results

High level of O_2 burst activity of macrophages on oxidizing the antigen was observed after 24 hours in the groups then decreased progressively ($p<0.05$) (figure. 1A). The relative expression of HIF-1α in 24, 48, and 72 hours groups were higher significantly than control groups, however the level was significantly lower than 24 and 48 hours (figure. 1B). These relative same phenomena was observed at the level of HIF-1α protein level. Group of 24 hours had a significant higher level of protein than the control, but in 72 hours group was lesser than 24 hours ($p<0.05$) (figure. 1C).

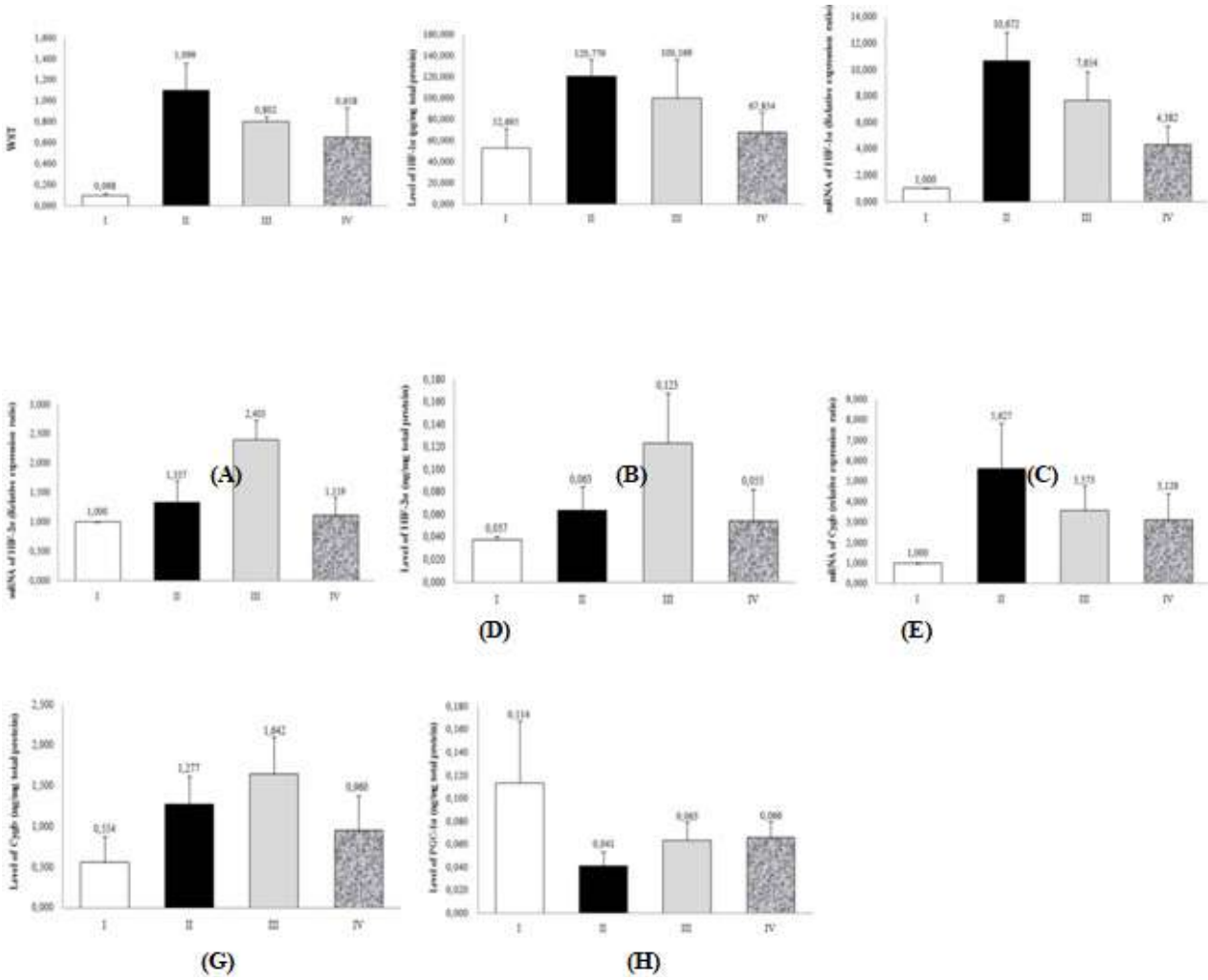

Figure 1. The results of the measurement of macrophages activity

Relative expression of HIF-2α mRNA start to increase significantly after 48 hours than control group, whereas in the 72 hours group, the level is lower significantly than 48 hours group (figure.1D). The same phenomena was found in the HIF-2α protein level (figure.1E).

Relative expression of Cygb mRNA was significantly increased on 24 hours group (figure.1F), however different phenomena was found in the Cygb protein level. Level of Cygb protein was significantly increased on 48 hours group ($p<0.05$) (figure.1G).

PGC-1α protein level decrease significantly in 24 hours group than control group, however 48 and 72 hours group were not differ significantly from control group (figure.1H).

Discussion

Infiltration of foreign bodies will trigger a series of defense reaction which can be divided in two stage, i.e. innate and adaptive immunity responses. Both kinds of immune response are connected each other by macrophages in the innate immunity response. Macrophages migrate to the conflict area and engulf the foreign bodies and destroy it by two main mechanism; oxidative and lysis destruction.[1]

Those foreign bodies which injected intraperitonealy, and then observation were made on the spleen macrophages. It means that some of macrophages migrated and stay in the spleen, a process which needs; a great number of energy. The destructing of foreign bodies by oxidation is well known as oxidative burst, a process which consume great number of O_2 exceeding

the metabolic needs. These stage of innate immune response requires big amount of O_2 used for energy supply and the O_2 burst.[1,14] This caused macrophages were in relatively hypoxic conditions. This conditionsis demonstrated by high level of HIF-1α and HIF-2α mRNA (figure.1B and1D) as well as protein (figure.1Cand1E). The relative hypoxic conditions continue to the next period because in this stage the macrophages begin to involve in more specific immunity.

In this stage, the macrophages have to cleave foreign bodies, presented on the cells surface in a complex with MHC II. To complete the immune response, the lymphocytes should arrive around the activated macrophages, in response of chemokine and interleukin.[1,15]

It's clear in this stage of immune response the macrophages must synthesis and secrete various type of proteins, which is high energy consuming process. To meet this energy needs, macrophages have to activate the aerobic metabolism, which occur in mitochondria.[15] All of this processes made the macrophages undergo a relative hypoxic condition. This proven by the persistent of HIF-1α and HIF-2α mRNA, as well as protein. Peyssonnaux C,et al[16]proved that macrophages, were exposing to bacteria, there will be an elevation of HIF-1α content. If the expression HIF-1α was inhibited, the bacteria killing activity will also decrease. Takeda N,et al[17] mentioned that inhibited HIF-1α expression on macrophages may also decrease iNOS expression which then used to eliminate antigen. Cygb, an extra erythrocytes hemoglobin, is needed as an O_2 binder in the cell and will transfer the O_2 to mitochondria, which are active as shown by high level of Cygb mRNA and protein beyond 24 and 48 hours (figure.1F and1G), high optical density from WST beyond 24 hours (figure.1A). In addition, elevated activity of Cygb were markedby high level of PGC-1α in the relatively chronic stage, i.e. 48 and 72 hours after exposure to SRBC (figure.1H). Burmester T, et al[18] indicates that Cygb is significantly raised on low O_2 condition. This elevation is an adaptation effort of macrophages in hypoxic condition. Correlation between HIF-1α and Cygb are significant and positive, which proved that HIF-1α and Cygb are associated into each other. Thus, if the relative hypoxia occurs then the expression pattern Cygb also increased. Other studies have shown that HIF-1α also regulate the increased expression of Cygb mRNA and protein on condition of hypoxia in rat liver.[19]

HIF-1α generally response only to hypoxia for the first 24 hours (figure.1B). In this observation we found that HIF-1α were in high level during the observation. HIF-2α is often associated with chronic stage hypoxia and also in differentiated cells process. In our observation we could assume that the macrophages might differentiate from resting tissue response macrophages to antigen presenting macrophages. It is also possible that the macrophages differentiate into M1 and M2 types.[18, 20]

Over all, activated macrophages are in relatively hypoxic condition as a result the increase of O_2 needs,[21] which is used in innate and more specific immunity process. All of this is indicated by the high level of HIF-1α, HIF-2α, Cygb and PGC-1α.

Conclusion

This study shows the expression pattern of several proteins in spleen macrophages of mice that was immunized. The different expression pattern is the adaptation responses that occurs in macrophage cells.

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The Emerging Risk of Interaction Between Complementary Alternative Medicines and Cardiovascular Medicines

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Abstract

Herbal medicinal use has increased dramatically in recent years. Use of herbal products forms the bulk of treatments, particularly by elderly people who also consume multiple prescription medications for comorbid conditions, which increases the risk of adverse herb-drug-disease interactions. Despite the paucity of scientific evidence supporting the safety or efficacy of herbal products, their widespread promotion in the popular media and the unsubstantiated health care claims about their efficacy drive consumer demand. In this review, we highlight commonly used herbs and their interactions with cardiovascular drugs.

Keywords: *Interaction, Alternative Medicines, Cardiovascular Medicines*

Introduction

Herbal medicine is still the mainstay of about 75-80% of the world population, mainly in the developing countries,for primary health care[1]. This is primarily because of the general belief that herbal drugs are without any side effects besides being cheap and locally available[2]. According to the World Health Organization (WHO), the use of herbal remedies throughout the world exceeds that of the conventional drugs by two to three times[3]. The use of plants for healing purposes predates human history and forms the origin of much modern medicine. Many conventional drugs originated from plant sources: a century ago, most of the few effective drugs were plant based. Examples include aspirin (willow bark), digoxin (from foxglove), quinine (from cinchona bark), and morphine (from the opium poppy)[4].

Medical history from the beginning of time is filled with descriptions of persons who used herbs to heal the sick of the society. However, parallel to the onset of the industrial revolution we witnessed the rise of allopathic medicine. Herbal medicine was also an effective healing method, but was viewed less enthusiastically[5]. Herbal products were discarded from conventional medical use in the mid-20th century, not necessarily because they were ineffective but because they were not as economically profitable as the newer synthetic drugs [6]. In the early 19th century, scientific method become more advanced and preferred, and the practice of botanical healing was dismissed as quackery. In the 1960s, with concerns over the iatrogenic effects of conventional medicine and desire for more self-reliance, interest in "natural health" and the use of herbal products increased. Recognition of the rising use of herbal medicines and other non-traditional remedies led to the establishment of the office of Alternative Medicine by the National Institute of Health USA, in 1992. Worldwide,herbal medicine received a boost when the WHO encouraged developing countries to use traditional plant medicine to fulfill needs unmet by modern systems [7].

Patients are increasingly using herbal products for purportedly preventive and therapeutic purposes[8]. Some products have direct effects on the cardiovascular or hemostatic system, whereas others have indirect effects through interactions with medications that could lead to serious consequences[9]. Common herbal remedies that produce adverse effects on the cardiovascular system include St. John's wort, mother wort, ginseng, gingko biloba, garlic, grapefruit juice, hawthorn, saw palmetto, danshen, echinacea, tetrandrine, aconite, yohimbine, gynura, licorice, and black cohosh (Table 1).

Table 1: Herbal Products to Avoid in Patients With Cardiovascular Diseases*[9]

Herb	Purported Use	Cardiac Adverse Effect of Interaction
Alfalfa	Arthritis, asthma, dyspepsia, hyperlipidemia, diabetes	Increasesbleedingriskwithwarfarin
Aloevera	Wounds (topical), diabetes (oral)	Hypokalemiacausingdigitalistoxicityandarrhythmia
Angelica (dongquai)	Appetiteloss, dyspepsia, infection	Increasesbleedingriskwithwarfarin
Bilberry	Circulatorydisorders, localinflammation, skinconditions,	Increasesbleedingriskwithwarfarin diarrhea, arthritis
Butcher's broom	Circulatorydisorders, inflammation, legcramps	Decreaseseffectsofalpha-blockers
Capsicum	Shingles, trigeminalanddiabeticneuralgia	Increasesbloodpressure (withMAOI)
Fenugreek	Highcholesterol	Increasesbleedingriskwithwarfarin, hypoglycemia
Fumitory	Infection, edema, hypertension, constipation	Increaseseffectsofbeta-blockers, calcium-channelblockers, cardiacglycosides
Garlic	Highcholesterol, hypertension, heartdisease	Increasesbleedingriskwithwarfarin
Ginger	Highcholesterol, motionsickness, indigestion, antioxidant	Increasesbleedingriskwithwarfarin
Ginkgo	Poorcirculation, cognitivedisorder	Increases bleeding risk with warfarin, aspirin, or COX-2 inhibitors
Potentialriskofseizures		
Ginseng	Aging, diminishedimmunity, improvesmentaland Increasesbloodpressure physicalcapacityandstress tolerance Decreaseseffectsofwarfarin	
Hypoglycemia		
Gossypol	Malecontraceptive	Increaseseffectsofdiuretics
Hypokalemia		
Grapefruitjuice	Weightloss, topromotecardiovascularhealth	Increaseseffectsofstatins, calcium-channelblockers, orcyclosporines
Greentea	Improvecognitiveperformance, mentalalertness,	Decreaseseffectsofwarfarin (containsvitaminK)
weightloss, diuretic		
Hawthorn	CHF, hypertension	Potentiatesactionofcardiacglycosidesandnitrates
Irishmoss	Ulcers, gastritis	Increaseseffectsofantihypertensives
Kelp	Cancer, obesity	Increaseseffectsofantihypertensiveandanticoagulantagents
Khella	Musclespasms	Increaseseffectsofanticoagulantagentsandcalcium-channelblockers
Licorice	Ulcer, cirrhosis, cough, sorethroat, infections	Increasesbloodpressure
Hypokalemia		
Maypotentiatedigoxintoxicity		
Lilyofthevalley	CHF	Increaseseffectsofbeta-blockers, calcium-channelblockers, digitalis, quinidine, steroids
Ma-huang (ephedra)	Obesity, cough	Increasesheartrateandbloodpressure
Night-bloomingcereus	CHF	Increaseseffectsofangiotensin-convertingenzymeinhibitors, antiarrhythmics, beta-blockers, calcium-channelblockers, cardiacglycosides
Oleander	Musclecramps, asthma, cancer, CHF, hepatitis,	Heartblock psoriasis, arthritis
Arrhythmia		

Herb	Purported Use	Cardiac Adverse Effect of Interaction
Death		
St.John'swort	Depression	Increasesheartrateandbloodpressure (withMAOI) Decreasesdigoxinconcentration
Storphanthus	CHF	Increaseseffectsofcardiacglycosides
Yohimbine	Impotence	Increasesheartrate

Results

Forty-three case reports (appeared in 21 publications) and eight clinical studies were located [10–38]. Warfarin was the most common drug involved (37 cases and 1 clinical trial) [14–30]. Key data from these publications are summarized below.

Clinical interactions between herbal medicines and conventional cardiovascular drugs

1. Digoxin:

a. It interacts with **Gum guar** which will decrease plasma digoxin concentration by decreasing its absorption (Guar gum reduces gastric emptying, which result in a transient delayed digoxin absorption) [10].

b. It interacts with **St. John's wort** which will decrease plasma digoxin concentration by Induction of P-glycoprotein (Digoxin is a substrate of P-glycoprotein which is induced by St. John's wort)[11].

c. It interacts **Siberian ginseng** which willincrease plasma digoxin concentration, Some component of Siberian ginseng might impair digoxin elimination or interfere with the digoxin assay (Siberian ginseng inhibits the metabolism of hexobarbital in mice)[12].

d. It interacts with **Wheat bran** which will decrease plasma digoxin concentration by decreasing its absorption (Bran contains fibers which can trap digoxin) [13].

2. Warfarin:

a. It interacts with **Boldo/Fenugreek** that will lead to increase the anticoagulant effect of warfarin due to the additive effect on coagulation mechanisms (Both boldo and fenugreek contain anticoagulant coumarins) [14].

b. It interacts with **Curbicin** that will lead to increase the anticoagulant effect of warfarin due to the additive effect on coagulation mechanisms (Vitamin E contained in curbicin can antagonize the effect of vitamin K on coagulation) [15].

c. It interacts with **Danshen** that will lead to increase the anticoagulant effect of warfarin due to the additive effect on coagulation mechanisms (In addition to its antiplatelet activity, danshen decreases)[16-18]

d. It interacts with **Devil's claw** that will lead to increase anticoagulant effect, purpura through unknown mechanism (In contrast to NSAIDs, devil's claw does not affect platelet function) [19].

e. It interacts with **Dong quai** that will lead to increase the anticoagulant effect of warfarin due to the additive effect on coagulation mechanisms (Dong quai contains anticoagulant coumarins) [20-21].

f. It interacts with **Garlic** that will lead to increase anticoagulant effect and increase in clotting time of warfarin due to the additive effect on coagulation mechanisms (Garlic has antiplatelet activity) [22].

g. It interacts with Ginkgo which will lead to intracerebral hemorrhage due to the additive effect on coagulation mechanisms (Ginkgolides from ginkgo have antiplatelet activity and are PAF receptor antagonists) [23].

h. It interacts with **Ginseng** that will lead to decrease anticoagulant effect through unknown mechanism (Antiplatelet activity of ginseng has been reported but would not seem to explain this case of decreased anticoagulation; a pharmacokinetic study in rats did not reveal a significant interaction between warfarin and ginseng) [24].

i. It interacts with **Green tea** that will lead to decrease anticoagulant effect through pharmacological antagonism mechanism (Warfarin produces anticoagulation by inhibiting production of the vitamin-K dependent clotting factors. Green tea contains vitamin K and thus antagonize the effect of warfarin) [25].

j. It interacts with **Lycium** that will lead to increase the anticoagulant effect of warfarin through unknown mechanism (The weak inhibition of Lycium on hepatic enzyme could not explain such interaction)[26].

k. It interacts with **Mango** that will lead to increase the anticoagulant effect of warfarin through Hepatic enzyme inhibition (Mango contains high amounts of vitamin A and human studies have shown that vitamin A (retinol) inhibits CYP2C19 enzymes) [27].

l. It interacts with **Papaya** that will lead to increase anticoagulant effect through unknown mechanism[28].

m. It interacts with **PC-SPES** that will lead to increase anticoagulant effect through Additive effect on coagulation mechanisms (PC-SPES contains anticoagulant coumarins) [29].

n. It interacts with **Soy** that will lead to decrease anticoagulant effect through unknown mechanism[30].

o. It interacts with **St. John's wort** that will lead to decrease anticoagulant effect through hepatic enzyme induction (Warfarin is metabolized by CYP 1A2 in the liver, which is induced by St. John's wort)[31].

3. **Diuretic Thiazide:** Ginkgo Increase in blood pressure with an unknown mechanism, This action may be due to effect of Ginkgo as a vasodilator for peripheral blood vessles. Which may have a dangerous effects on patients[31].

4. **Liquorice:** Liquorice may interact with antihypertensive agents, this interaction may result in Hypokalemia, this effect is explained by liquorice ability to increase potassium excretion due to its mineralcorticoid effects, Serum potassium levels should be monitored closely in patients who are predisposed to cardiac arrhythmias and who are concurrently treated with digitalis glycosides[32].

5. **Aspirin:**

   a. Ginkgo biloba extract may interact with Aspirin and increase bleeding tendency, this effect is thought to be caused by Ginkgolides ability to inhibit platelets aggregations and also by ginkgolides antagonsitic activity on PAF receptors, rarely, some pateints develop spontaneous bleeding from the iris into the anterior chamber of the eye[33].

   b. Tamarind interacts with Aspirin with an unknown mechanism but it is known that Tamarind increases the oral bioavailability of Aspirin[34]

6. **Phenprocoumon:** St. John's Wort interact with Phenprocoumon and decreases its anticoagulant activity through its inductive effects on hepatic enzymes that are responsible for the metabolism of the drug, this effect is seen as an increase in Quick-Wert test which means a reduction in anticoagulant effect[35].

7. **Simvastatin:** St. John's Wort interact with Simvastatin and Decreased plasma simvastatin concentration, this effect is due to Hepatic enzyme induction, Simvastatin is extensively metabolized by CY3A4 in the intestinal wall and liver, which are induced by St. John's wort[33].

8. **Lovastatin:** It interacts with Oat bran and Pectin, both cause decreasing in Lovastatin absorption and the decreased absorption of Lovastatin resulted to an increase in LDL levels which led to the abortion of the trial. Lovastatin pharmacokinetics and LDL returned normal after pectin discontinuation[35].

Method

Systematic literature searches were made using Medline (via PubMed, from January 1966 to February 2003). The search terms were herbal medicine, botanical medicine, phytotherapy, drug interaction, adverse effects, side effects, adverse drug reaction, safety and toxicity. Recent books on herb–drug interactions or herbalism[21–26] were also searched for further relevant information. Additional publications were identified by checking all reference lists and by searching our files. No language restrictions were imposed. All clinical reports on interactions were read and relevant data were extracted by the first three authors into predefined table and validated by the senior author. In vitro experiments have been excluded.

Discussion

Herbal medicines follow modern pharmacological principles. Hence, herb–drug interactions are based on the same pharmacokinetic and pharmacodynamic mechanisms as drug–drug interactions [5]. Herbal medicines may affect absorption (e.g. guar gum reduces digoxin absorption) [27], metabolism (e.g. St.

John's wort increases warfarin metabolism, causing decreased anticoagulant effect) [9] or excretion (St. John's wort increases digoxin renal excretion) [28] of concurrently administered cardiovascular drugs. Herb–drug interactions that involve distribution mechanisms have not been reported. Moreover, interactions may be additive or synergetic, whereby the herbal products potentiate the action of the conventional cardiovascular drug (e.g. ginkgo potentiates the antiplatelet effect of aspirin) [33]. Conversely, the herb may be directly antagonistic to the action of the drug (e.g. green tea antagonizes the anticoagulant effect of warfarin) [35].

Based on the above evidence, there can be little doubt that interactions between herbal medicines and cardiovascular drugs exist. The real incidence of such interactions is probably unknown, as is the likelihood that a patient will have an adverse event when taking two drugs (i.e. herbal and conventional medicines) with the potential to interact. Much of the available information about the interaction between herbal medicines and cardiovascular pharmacotherapy is gleaned from case reports, although clinical studies are now also beginning to appear in the literature. Obviously, case reports have to be interpreted with great caution, ascausality is not usually established beyond reasonable doubt. To establish causality is, of course, a difficult task. Rechallenge would be the most straightforward clinical test, but for obvious reasons, this option is not always available. Hence, even well-documented case reports (and many are not well documented) can only serve as a critical early warning system.

Conclusion

Interaction between herbal medicine and cardiovascular drugs is a potentially important safety issue. Patients under anticoagulant pharmacotherapy are at the highest risk. Healthcare professionals need to be aware of potential herb–drug interactions and researcher should strive to fill the numerous gaps in our present understanding of this problem.

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Effect of Exercises Using a Pressing Tool on Some Biochemical and Skilled Variables of Tennis Players

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Abstract

This study aims to identify the effect of exercises using a pressing tool for the arms on some biochemical and skilled variables for tennis players. An experimental design was used to guide this study. The study included a purposive sample of six players from Al-Jaish Sport Club who practice tennis. These players were received the administered intervention. To ensure the subjects' homogeneity and normal distribution, the researcher used the mean, standards deviation, and skewness for the filed survey. The researcher concluded that there were statistically significant, within normal limit increase in the white and red blood cells counts as they include all what lead to increase body toxins and waste-products of harmful cells. The researcher recommends paying attention to the biochemical variables for the players throughout training in order to develop their physiological abilities.

Keywords: *Pressing Tool; Biochemical and Skilled Variables; Tennis.*

Introduction

Athletes' abilities have witnessed a dramatic improvement [(1)] seen in Olympic events since the launch of the modern Olympic chapter has been accounted for by different mechanisms[(2)]. The increase in the rate of participation, professional behavior (of participants and coaches), natural selection, enhanced training, nutrition, and psychological preparation, step forward in technique, and the innovation in technology in terms of the design of equipment and ergonomic aids collectively have served as contributing factors[(3-4)].

The fact of what happens to the athletic body; due to using training efforts, became one of the most important requirements of training currently. This could be attributed to the scientific revolution that the scientists have made in the sport discipline in terms of advancement in devices and practical and scientific method that fit achieving the sport performance. Thereafter, the performance depends on the level of adaptation of the functional systems on the training work. Such a work is currently measured depending on the response of the different body organs; particularly if we know that the sport training; from physiologic perspective, is "a set of exercises or physical efforts that lead to adaptive goals or functional change in body systems and internal organs in order to achieve high level of achievement". As such, the training efficiency related to assessment of the response of functional systems and their adaptation drawn the trainers' attention and preparing their method to achieve good and new results the player frequently seeks.

Selecting the exercise in accordance with the specific game, the player's level, the training duration that they are on, and intensity and amount of training are considered as of the most important indicators of direct effect on the systems and tissues of the players' body. Thus, in order to know what happens in the body of tennis players who experience required training for hours. In order to overcome the negative points owing to overload and improving the players' levels, it is crucial to adopt special training in the light of hypoperfusion using a pressing tool over the arms to cause hypoperfusion for the given extremity. As such, the occurrence of hypooxygenation and nutrients consequences, which in turn increase the ability to resist fatigue owing to hypoperfusion during training.

After finishing the training, the pressing tool is removed to shift to the perfusion stage. Thus, the delivery of large amount of oxygenated blood and nutrients. This is a modern method that leads to increase player's ability to perform for as long as possible without the occurrence of muscular fatigue during games and training. The

importance of this study represented in adapting the tennis players on the hypooxygenation statuses and the muscle's tolerance for acids that result from anaerobic system and benefit from adaptations occurred as a result of hypoperfusion for the arms in increasing the tolerance strength of the muscle for physical stress in lack of oxygen and increase blood Ph.

Problem Statement: The main research problem lays in the question "Is the tool pressing over the arms of positive effect in improving the muscles' ability in tolerating the burden of hypoperfusion and in turn the lack of oxygen and nutrients delivered to the muscles and urging the muscles to work much strongly and maximum muscular tolerance? As well, as this training method increases the muscles' dependence on the anaerobic systems to release the energy required for muscular work, so such a method can serve to develop the speed ability irrespective of the compound abilities. This in turn serves to improve the performance of the working muscles; particularly in the forehand and backhand shots in tennis.

Study Objectives: This study aims to identify the effect of exercises using a tool pressing over the arms on some biochemical and skilled variables for tennis players.

Research Hypothesis: The researcher hypothesizes that there are statistically significant differences in the pretest and posttest in terms of some biochemical and skilled variables among tennis players.

Research Dimensions:

The Human Dimension: Al-Jaish Sport Club tennis players

The Time Dimension: The duration from January 12th, 2018 to May 22nd, 2018.

The Spatial Dimension: Baghdad – Al-Jaish Sport Club field for tennis and Al-Shaab Stadium for tennis.

Definition of Terms:

The Pressing Tool: It is a pressing belt (arterial pressing tool) that is tied to the arm over the brachia to impede blood delivery to the arm, lower brachia, and the hand.

Method

The researcher used the experimental design as it fits the research problem, "Controlling over the influencing factors surrounding the experiment; except for the independent variable in order to measure its effect on the dependent variable[5].

Sample and Sampling: The study included a purposive sample of six advanced tennis players who were selected from Al-Jaish Sport Club. All these players are exposed to the experimentation (pre-posttests).

Tools:

Observation and experimentation

Information sheet

Personal interview

Resources and references

Exercises

Internet

A tool pressing over the arm

Whistle

Legitimate Tennis racket size (53-58 cm), (n = 10)

Tennis balls (n = 50)

A basket for the balls

Legitimate tennis field

Medical syringes

Devices used in the study:

Timer watch (Chinese-made – Swan, n = 2)

Blood centrifuge

Restameter (to measure height and weight)

Camera (Nikon, n = 2)

Stopwatch (n = 3)

Clinical procedures:

Tests used in the study:

Forehand and Backhand Shots Precision Test[6]

Forehand and Backhand Shots Depth Test[6]

Pilot Study: The pilot study was conducted in Al-Karkh Sport Club field in Baghdad City on January 27th, 2018 on three tennis players who are not included in the final sample size.

Pretests: The pretests were conducted under the researcher's supervision. The study procedures, number

of trials, points counting method and recording, and the conditions of other tests were explained to the study participants on February 3rd, 2018 to conduct the skilled tests.

The Main Experiment: The researcher has prepared exercises that are set in 24 training sessions distributed over three training sessions per week. They include exercises in the main part of the training sessions designated for the tennis players after the thorough reviewing of the literature and experts in tennis in accordance with the training tool that the researcher used for training in hypoperfusion for the arms. This can be implemented via closing the artery in the working brachial muscle for a specific duration and the augmentation of using the pressing tool in line with the exercise duration. The level of oxygen is decreased inside the muscular tissues where the blood stream (unoxygenated blood) is impeded to the cells which leads to hypooxygenation. This process is accompanied by an increase in the accumulation of the lactic acid in the muscles and dilation of the blood vessels. On accomplishing "opening the artery and releasing blood stream", the blood circulation supplies the muscles with oxygen and eliminate the cellular waste products that cause arterial dilation, in addition to the elimination of lactic acid through transforming some of its compounds into other compounds. The time of using the pressing tool goes in line with the time of performing the exercises that includes four sessions in a time of one minute for each frequency and 30-second for rest among frequencies. That is, four minutes for using the pressing tool in the exercise and so on. The exercises were initiated on February 10th, 2018.

Posttests: The researcher conducted the posttests at 11:00 a.m. on April 28th, 2018. The same method used in the pretest was used in the posttest, considering the same spatial and time conditions, and the same testing method and devices, and the auxiliary team who helped in conducting the pretest.

Statistical Measures: The statistical package for social sciences (SPSS) for windows, version 24, IL, Chicago was used to analyze data.

Study Results: Results of Ph, hemoglobin, precision of forehand and backhand shots, and the depth of forehand and backhand shots.

Table 1: Mean, standard deviation, t-value, and significance level

List	Variables		Pretest		Posttest		T-value	Sig.	Ass.
			Mean	SD	Mean	SD			
1.	Biochemical	White blood cells g/L	6.980	20.08	9.210	0.760	5.340	0.000	S
2.		Hb	14.640	0.650	14.740	0.890	3.760	0.000	S
3.	Precision of forehand and backhand shots		27.290	1.760	32,460	1,650	9.640	0.000	S
4.	Depth of forehand and backhand shots		25.120	2.180	30.650	1.870	10.760	0.000	S

Ass. = Assessment; Hb = Hemoglobin; SD = Standard deviation; Sig. = Significance; S = Significant
Significance level is at (0.05) and a degree of freedom (df) = 5

Discussion of Pretest and Posttest

Table (1) demonstrates the statistically significant differences and the t-value in favor of the posttest for the variables under investigation. This indicates the development of skills for the learners. The researcher attributes this to the used exercises in the helping tool which effectively contributed to skills development. The researcher explains this to that the tool used works to impede the delivery of oxygen to inside the muscular tissues, where the blood stream (unoxygenated) is impeded from the cells which in turn leads to a decrease of oxygen and the dependence of the muscle in generating the energy anaerobically. When finishing (opening the artery and allowing the arterial blood to normally pass through, in which the blood supply to the cells is increased, where the blood circulation supplies the muscles with oxygen and eliminates the waste products of the cellular interaction. Furthermore, the lactic acid is eliminated through its oxidation and the transformation of some of its compounds into other compounds. Moreover, the exercises that are applied with the help of the tool contributed to increase the number of white blood cells which is attributed to the increase in the uniting ability of these cells to eliminate what the exercise produce of debris of cell membranes after accomplishing the performance of exercises. This was emphasized by Alexander in that "The modification of exercises that

are performed daily by their practitioners increase the white blood cells numbers owing to the increase of immunologic response [7]. This means that following the player up in the training from the physiologic perspective contributes a lot to know the effect of training on the training sessions. The decrease of oxygen delivery to the working extremities leads to increase the release of red blood cells from their storages. Wang indicates that the exercise greatly increases the red and white blood cells counts owing to their exit of their storages [8]. Using the pressing tool helped in increase the secretion of Erythropoietin from the kidney which is triggered by the decrease of arterial blood saturation with oxygen, which in turn works and triggers the increase of production of red blood cells within few hours. This is cannot be done in an altitude of 2100 feet. Despite of increasing the secretion of hormone, it is observed that no increase in the mass of red blood cells for several weeks [9].As a result of the biochemical changes and their importance in the physical, anaerobic effort which contributed to the improvement in the precision and depth of the forehand and backhand shots which require incessant physical effort; particularly during competition.

Conclusions

1. The training using the pressing tool have affected the biochemical, anaerobic variables.
2. The increase of white and red blood cells to a statistically significant degree within normal limits owing to their inclusion of all what to lead to increase the bodily toxins or harmful waste products.
3. An improvement in the precision and depth of the forehand and backhand shots in tennis.

Implications:

1. It is necessary to pay attention to the players' biochemical variables throughout the training duration and considering these variables with the goal of improving the players' physiologic abilities.
2. It is crucial to conduct the periodic measurements for the players' biochemical variables in order to identifying the level that these players arrived.
3. There is a need to conduct further studies for the biochemical variables.
4. There is a need to replicate similar studies on different samples of players in different age groups.

Conflict of Interest: The researchers report no conflict of interest.

Funding: This study did not receive any funding from any agency.

Ethical Clearance: A permission to conduct this study was obtained from the ethical committee in the College of Basic Education, University of Mustansiriyah.

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Evaluation of Angiopoietin One and Angiopoietin Two with Missed Abortion

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Abstract

Missed abortion (MA) is a type of miscarriage, refer to pregnancy in which there is fetal demise without intervention, and also uterine that may expel the product of conception prior to 20 weeks of gestation. To assess the role of ANG1 and ANG2 level in early pregnancy and compare these level with healthy pregnancy women, ANG1 play role in new blood vessels maturation and stabilization, the inhibition of endothelial apoptosis and reduction of vascular permeability in stable environment. ANG2 is an antagonist of ANG1 and it known to enhance the plasticity, destabilization and permeability of blood vessels and vascular remodeling site.A prospective cross - study, all women were attended to obstetrics and gynecology outpatient**,**and this study was carried out from Jan 2019 to July 2019. Sixty Women with missed miscarriage fetus heart negative 6-8 weeks were screened to participate in the present study group, Ages were between 18 – 35 years old, and they were from center and the periphery of Kirkuk city to comparative forty apparently health women with early pregnancy fetus heart positive a control groups. A serum level of ANG1 and ANG2 was measured by ELIZA. The result shows that the mean serum level of Angiopoietin one was significantly decrease in missed mischarge compared to control women (2.92±2.4 *vs*. 5.6±3.2 ng/ml) respectively at a $P < 0.05$. And this study showed that there was the significant decrease serum level of angiopoietin two in missed miscarriage patients compared with the control group women (8.12±3.5 *vs*. 16.81 ±12.3). This study showed that there were the positive correlations of Angiopoietin one and two with missed miscarriage. It can be conclude that the level of serum Angiopoietin-1 and level of serum angiopoietin-2 in missed abortion decrease and it is can be used as an early and effective biomarker for diagnosis of missed abortion.

Keywords: *Angiopoietin-1, Angiopoietin-2, missed abortion, Biomarker.*

Introduction

Spontaneous abortion in the ending of pregnancy by removal or expulsion of an embryo or fetus before it can survive the uterus; an abortion without intervention is known miscarriage or spontaneous abortion. Spontaneous abortion can be divided into various subtypes: threatened, inevitable, incomplete, complete, and missed abortion.(1) When deliberate step are taken to end the pregnancy it called an induced abortion or less frequently induced miscarriage. Miscarriage also known spontaneous abortion is the intentional expulsion of an embryo or fetus before the 24 week gestation. Missed abortion is defined is a condition with retained products of conception, with no cardiac activity but the uterus is still silent making no attempt to expel the fetus or unrecognized intrauterine death of the embryo or fetus without expulsion of the product of conception it is constitutes approximately 15% of the clinically diagnosed pregnancies(2). Accurate differentiation between normal pregnancy and pregnancy loss in early gestation remains a clinical challenge; it is estimate that approximately 30-40% of implanted pregnancy result in spontaneous abortion during first trimester(3). Clinical feature in the typical instance .early pregnancy appearance to be normal .with amenorrhea, nausea, vomiting, growth of uteruses and breast change after fetal death there may or may not be vaginal bleeding, abdominal pain, cramping, vaginal spotting .other symptoms denoting missed miscarriage many woman have no symptoms during this period except persistent amenorrhea. No symptoms for missed abortion appear for several weeks and if appear, these vary from spotting

to heavy vaginal bleed and loss of pregnancy symptoms. Signs of missed abortions include loss of fetal heart sounds and closure of cervical[4]. The etiological factors for missed abortion include chromosomal abnormalities, maternal, fetal and embryonic malformations, placental and uterine anomalies, history of recurrent abortions, sexually transmitted diseases, thyroid disease and maternaldiabetes.[5] Complications of missed abortions may include pain, Fever, hemorrhage, retained products of conception, septic shock, bladder, bowel and uterine injuries andperforation [6]. Angiopoietin 1 encodes a 484 amino acid with M.W 57 KD, has ability to form higher order multimers though it super clustering. However not all structure can interact with tyrosine kinase receptor, the receptor can be only be activity at the tetramer level or high[7]. ANG1 act as chemo attractant for endothelial cell while also promoting endothelial cell sprouting and facilitating tissue invasion by nascent blood vessels through activation MMPS[8]. It plays critical role in mediating reciprocal interaction between the surrounding matrix and mesenchyme and inhibits endothelial permeability protein also contribute to blood vessel, maturation and stability and may be involved in early development of the heart[9]. Angiopoietin 2 encodes 466 amino acid polypeptides with mocular weight 75 KDa. AGPT2 are secreted glycoproteins that play a complex role in angiogenesis and inflammation, ANGPT2 is widely expressed during development, but it is to restricted postnatal to high angiogenic tissue such as placenta, ovaries and uterus.[10]. The aim of this study is to estimate the level of angiopoietin 1 and angiopoietin 2 in patient missed abortion. Furthermore, the current study objectives are:

1. To determine the serum angiopoietin one with patient missed abortion.
2. To determine the serum of angiopoietin two with patient missed abortion.
3. To determine the serum angiopoietin one and two with pregnancy women.
4. Find correlation and level angiopoietin one and two with patient with missed abortion and compared with pregnancy women as control group.

Materials and Method

Study design: A prospective cross–sectional study, hospital based study the protocol of this study was approved by the scientific committee of Tikrit University College of Medicine, the agreement of attendance to Azadi Teaching Hospital, Kirkuk General Hospital and Kirkuk Department of Obstetrics and Gynecology Center, that approved by Kirkuk Health Directorate, to collect the samples from the patients.

This study was carried out from March 2019 to august 2019. The patients admitted Department of Obstetrics and Gynecology, unit in hospitals Kirkuk City-Iraq. An interview was carried out with these patients using questionnaire form designed by the investigator including their name, age, etc.

Study Population

Patient and Control: Sixty women with missed abortion were screened to participate in the present study. Men ages were between 18–35 years old, and they were from center and the periphery of Kirkuk city. Sixty–case with missed abortion were considered as study group, while thirty woman normal pregnancies as control group.

Patient sample were inclusion criteria:

1. Woman in the age between 18 -35 years
2. Natural conception
3. History of positive pregnancy test
4. Intrauterine pregnancy
5. First attendance in the pregnancy

Patient sample were Exclusion criteria:

1. Pregnant women who refuse to participate in this study
2. Gestation age less than 6 weeks or more than 8 weeks
3. Multiple gestations
4. Ectopic pregnancy
5. Previous history of infertility
6. History of autoimmune or endocrine diseases (D.M, ALP, POS)
7. Smoker patient
8. Patient with recognizable cause of recurrent missed abortion

Sampling: Five ml of blood sample were taken by vein puncture from each subject enrolled in this study. Blood samples were placed into disposable gel test tubes, after 20 minute blood clotting, centrifuged at

5000 rpm for 15 minute and the obtained serum were aspirated using mechanical micropipette and transferred into clean test tubes which labeled and stored in deep freeze at –80 C^O for biochemical measurement of the levels of angiopoietin one and angiopoietin two were measured.

Result

This study includes ninety pregnant women and in there is first trimester they were divided into two groups:

1. First group represent 60 pregnant women with missed miscarriage were considering studies group F.H (-ve).
2. Second group represent 30 pregnant with normal intrauterine pregnancy .were considered as control group F.H (+ve).

There ages were ranged between 18 -35 years, were investigation for determination Angiopoietin one and Angiopoietin two in both group.

Serum level of angiopoietin one in missed miscarriage and the

Control Group: As show in the table (1), the mean serum level of angiopoietin one was significantly decreased in women compared to control women

(2.94 ± 2.4 *vs* 5.6 ± 3.2 ng/ml*)* respectively at a p< 0.05**.**

Table (1): The mean and standard deviation of serum Angiopoietin one in missed miscarriage and control group.

Angiopoietin One (ng/mL)	Missed Miscarriage Women	Control Group
NO	60	30
Mean	2.94	5.6
SD.	2.4	3.2

t.test 4.02 p. value < 0.05 Highly Significant

Serum level of angiopoietin two in missed miscarriage and the

Control Group: As show in the table (2), the mean serum level of angiopoietin two was significantly decreased in women compared to control women

(8.12 ± 3.5 *vs* 16.81 ± 12.3 ng/mL)respectively at a p < 0.05**.**

Table (2): The mean and standard deviation of serum Angiopoietin two in missed miscarriages and control group.

Angiopoietin Two (ng/mL)	Missed Miscarriage Women	Control Group
No	60	30
Mean	8.12	16.81
SD.	3.5	12.3

t.test 3.79 p. value < 0.05 Highly Significant

Correlation between angiopoietin one and angiopoietin two in missed miscarriage women: This study showed strong positive correlation between angiopoietin one and two with missed miscarriage women figure (1).

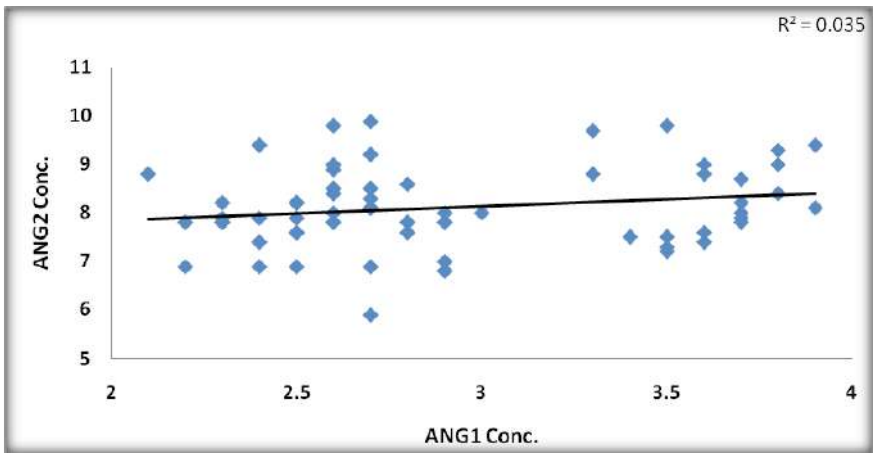

Figure (1): Correlation between angiopoietin one and two with missed miscarriage women

Discussion

Serum level of angiopoietin one in missed miscarriage and the Control group: This study showed that there was a significantly decrease serum level of Angiopoietin one in missed miscarriage compared with that of control group(intrauterine pregnancy)women same gestational age 6 – 8 weeks.

The result of study was agreement with Daponate*et al*[11] their study showed that optimal levels of serum Angiopoietin -1 were around 963.5 pg./ml (793.9 – 1277.6) in normal pregnancy women with gestation age 6-8weeks, and 810 pg/ml (595-767.9) in women with missed miscarriage. The current study showed that these value relatively higher level of angiopoietin one in normal pregnancy compared with women failed pregnancy, angiopoietin one is responsible for vascular growth and maturation of placenta, so deceased levels lead of angiopoietin one leads to increase chance of failure of pregnancy because of the defective vascular formation,when the every step of vessels formation is impaired starting from sprouting of vessels to maturation, then the chance of survival of the fetus decease due to lack of exchange of nutrient and waste product, impaired placental vascular development is related to imbalance in angiogenic factor, as implicated in pathological pregnancy .

Schneuer FJ, Roberts CL, Ashton AW, [12] studies conducted high level Angiopoietin one is mainly expressed in perivascular sertoli cell including pericyte, vascular smooth muscle cells,it binds specifically to the TIE2 receptor on peripheral endothelial membrane through paracrine function, causing phosphorylation of its receptor and subsequent signal transmission.

Serum level of angiopoietin two in missed miscarriage and the Control group: This study showed that there was a significantly decrease serum level of Angiopoietin two in missed miscarriage compared with that of control group(intrauterine pregnancy)women same gestational age 6 – 8 weeks.

The hypothesis of this study were compromised fetal growth is the result of compromised placental development and potential markers in maternal blood can detected those pregnancies risk, in view of it control role of angiogenesis we hypothesized that ANG2 maternal blood vessels would be increased at the first trimester when both maternal uterine vascular remodeling and placental branching angiogenesis take place, and level would be lower than normal in pregnancy destined for abnormal pregnancy.

This study shows it agreement with GevaE,*el at*[13] for angiopoietin -2 significantly decrease in missed miscarriage patient and recorded high level in normal pregnancy, and this result ANG-2 observed in women at 6-8weeks gestation may indicated that ANG-2 plays an important role in early placental angiogenesis, particularly in maternal vascular remodeling the lower maternal serum level of ANG -2 observed in women whose fetus subsequently developed IUGR may indicate compromised placental angiogenesis early pregnancy well before any clinical evidence of IUGR.

High level angiopoietin -2 in the normal pregnancy that ANG-2 mat also target fetal endothelial cell which also express the TIE-2 receptor thus potentially facial ting branching angiogenesis, and affect placental villous vascular change, interestingly TIE-2 is also express in endovascular trophoblast invading the uterine spiral arteries suggesting that an interaction between ANG-2 and TIE-2 may play significantly role in trophoblast behavior placental development.

Correlation between angiopoietin one and angiopoietin two in missed miscarriage women: This study showed strong positive correlation between angiopoietin one and angiopoietin two with missed miscarriage women. Angiopoietin -1 and angiopoietin-2 are both expressed in the placenta from the very early stage of pregnancy and they mediate number of endothelial and non-endothelial effect that are thought to be pivotal for proper placental development, ANG-2 stimulation an increase in trophoblast synthesis, ANG-1 act as a potent chemotactic factor for trophoblast .ANG-1 expression was restricted to the perivascular stroma of stem villi surrounding large blood vessels, supporting the hypothesis that angiopoietin -1 play role in maturation and maintenance of the placental vessels in contrast ANG-2 was expressed by the perivascular stroma of all placental villi. Furthermore this study show that level of ANG-1 and ANG-2 were significantly reduced in missed miscarriage and suggests that this decreased expression may therefore contribute to be reported poor angiogenesis.

Seval*el at*[14] with agreement with study a few previous in site hybridization studies have described the localization pattern of angiopoietin in the placenta in different stage of pregnancy in very early human

placenta (as early as the 4 theweek) ANG-1 protein was localized only in the cyncytiotrophoblast while ANG-2 was localized primarily in the cyncytiotrophoblast and less lesser extent in the cytiotrophoblastic layer of placental villi.

Previous study Dunk *el at*[15] demonstrated that ANG-1 and TIE-2 were detected in the trophoblast bilyar of first trimester placenta, where ANG-2 was restricted to cytotrophoblast in same study ANG-1 and ANG-2 were show to be implicated the regulation of trophoblast behavior through different mechanisms and to promote the growth and migration of trophoblast in vivo, which ANG-1 and ANG-2 and TIE-2 localized to the trophoblast, suggestion that the angiopoietin may play an autocrine role in the trophoblast function.

Conclusion

Serum angiopoietin -1and angiopoietin -2 levels decrease during pregnancy failure. The measurement angiopoietin -1 and angiopoietin -2 can be used first tool, to support the conformation of diagnosis of missed miscarriage.

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required.

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Predictive Value of Toprs Score in Outcome of Pediatric Patient in Emergency Installation

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Abstract

Background: Scoring of severity of illness in pediatric emergency is rarely found. The aim of this study was to evaluate TOPRS Scores of children admitted to pediatric emergency.

Method: It was a prospective cohort study on severity illness score on pediatric patient in emergency instalation of Wahidin Sudirohusodo Hospital during October until November 2016. The study population was all children admitted to pediatric emergency unit Wahidin Sudirohusodo Hospital. TOPRS scores were assessed since admission. Subjects were followed up two classified the outcome into two groups, improved group and died group Predictive ability of this scorring system was analyzed using ROC curve.

Results: Among 218 subjects, 46 were died, and 172 were recovered. TOPRS scores were higher in non survivor group, with the optimal cut off value ≥2 to distinguish survivor and died group. P=0.000, sensitivity=100%, specificity=89.5%, PPV=100%, and NPV=74%. Multivariate analysis showed that TOPRS scoring system was independent variable and can be used as a parameter to evaluate the aoutcome of the patients, with p value 0.000 (95% CI 0.00-).

Conclusion: TOPRS scoring system has a predictive value on children admitted to pediatric emergency instalation. Optimal cut off value to distinguish mortality is ≥2.

Keywords: *TOPRS score, pediatric emergency, outcome.*

Introduction

Systemic inflammatory response syndrome (SIRS) is a complex and unspecified inflammatory response to a body which is harmful to the body.[1,2] A study conducted in 2007 - 2010 at the National Hospital Ambulatory Medical Care Survey (NHAMCS) United States got the incidence of SIRS in children by 21.7%. Based on that research, 53% SIRS cases was caused by infection.[3]

TOPRS Score (Temperature, Oxygen Saturation, Pulse Rate, Respiratory Rate, Sensorium and Seizurer) is a relatively new scoring in illness severity degree. This score uses the physical symptoms (symptomatic) parameters in Systemic Inflammatory Response Syndrome (SIRS) and the criteria mentioned in Advanced Pediatric Life Support (APLS).[4] The TOPRS score was developed in a study as a tool that can be applied in emergency rooms especially in places with limited facilities.[5]

SIRS is non-specific and may be caused by ischemia, inflammation, trauma, infection, or some combination of damage. SIRS is not always associated with infection. Infection is defined as a microbiological phenomenon with characteristics as an inflammatory response to microorganisms or the normal invasion of

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sterile tissue by the organism.[6] A prior study by Daniela[7] during 2006-2009 in Craiova was obtained prevalence of pediatric patients with SIRS and having sepsis was 78%. Another study in Latvia found the prevalence of SIRS in treated children with febrile clinical symptoms was 72%.[8]

The presence of predisposing factors such as infectious diseases (respiratory tract, urogenitalia, skin and soft tissue), immune disorders (malignancy, radiation therapy, hormonal therapy), and invasive procedures may trigger the release of cytokines and vasodilator substances which will subsequently trigger the response systemic inflammation characterized by symptoms of tachycardia, tachypnea, hypotension, hypoperfusion, pyrexia or hypothermia, leukocytosis or leukopenia. Continuous inflammation will cause tissue damage, cellular metabolic changes, hemodynamic changes that will eventually lead to organ dysfunction and failure. Therefore, scoring system using clinical symptom variables is important to test the ability of predicting output.

Some research on scoring systems as predictors of outcomes has been done. One of the earliest physiological scoring systems in children is the PSI (Physiology Stability Index), in which the system assesses 34 variables. Furthermore, a simpler scoring system that is PRISM, which assesses 14 variables, in which the variable consists of physical and laboratory assessment. On the other hand, there is also a PIM (Pediatric Index Mortality) scoring system assessed at the time of admission to pediatric intensive care. Those kind of scoring systems cannot be used in emergency department, but it need a longer time to wait for laboratory results. It is also less suitable for use in developing countries such as Indonesia. Therefore, it is necessary to examine the scoring system as a simpler external predictor that combines vital signs,so this study is aimed to determine the TOPRS score of pediatric patients in pediatric emergency care.

Materials and Method

Design and Variable Study: This study was an observational with a prospective cohort approach at the emergency instalation of Wahidin Sudirohusodo Hospital, Makassar which conducted during October until November 2016. It has been approved by the ethical committee of Faculty of Medicine, Hasanuddin University.

The study variables consist of: independent variables (infectious and non-infectious diseases), dependent variables (TOPRS score and outcome), confounding varia bles (biological processes occurring in patients during treatment), random variables (sex, nutrition, and genetic), and control variables (age, basic disease treatment).

Population and Sample: Population of the study were patients who entered in the IRD of children aged 1 month to 18 years who underwent treatment at DR Wahidin Sudirohusodo Hospital, Makassar. The study sample was the entire affordable population that met the inclusion and exclusion criteria which obtained by using consecutive sampling method based on the order of admission in the hospital.

Method of Collecting Data: Anamnesis and physicals examination in patients aged 1 month -18 years was conducted at the first admission to the hospital. The result was confirmed by TOPRS score check. Age, sex, nutritional status, vital signs (awareness, blood pressure, respiration, pulse, temperature), oxygen saturation, presence or absence of seizures were checked. During the treatment, study subjects were observed until the effect (outcome) of the patient improved or died. The end result observed is the outcome (improved or died).

Data Analysis: All the data obtained are recorded in the study data form and then grouped by the destination and type of data. Appropriate statistical method was used analyse the data, namely: 1) the univariate analysis; and 2) the bivariate analysis which includes: test Student's t, Mann Whitney Test, X2 (Chi square) or Fisher's Exact test, to assess the accuracy limit levels as a predictor, calculating the sensitivity, specificity, positive predictive value and predictive value negative (with CI 95%).

Results

Out of 218 patients, there were 172 patients improved and 46 patients died. Based on the sex category, male group consists of 31 patients (24.21%) who were died and, 97 (75.78%) were improved, while female group consists of 15 patients (16.66%) who were died and 75 patients (83.33%) were improved. Statistical analysis showed no significant difference between the two groups with $p = 0.17$ (Table 1).

Table 2 showed the correlation between nutritional status and the patients' outcome. In well nourish group, 13 patients (11.92%) were died and 96 patients (88.07%)

were improved. In the under nourished group, 17 patients (34%) were died and 33 patients (66%) were improved, while malnutrition group consists of 16 patients (27.11%) who were died and 43 patients were improved (72.88%). Statistical analysis showed that there were significant differences in terms of improved outcome or death based on nutritional status with p = 0.003.

Based on the data analysis, it was found that the mean age of patients did not different significantly between the two groups that compared with p = 0.26. (Table 3). It means that age was not a prognostic factor in the outcome of patients in emergency installation, while nutritional status was a prognostic factor.

The average score of TOPRS score of study subjects showed that the average score of TOPRS score of patients who improved was lower than the score of the patient who died. Mann-Whitney test results show that there was a very significant difference between these two groups with p = 0.000 (Table 4).

The logistic regressi on analysis of the independent variables in predicting the outcome showed that the nutritional group B had p = 0.283 with confidence interval 95% (0.60-5.62). While the TOPRS variable ≥2 has p = 0.000 with confidence interval 0.00-, which shows the score of TOPRS is independent variable which is not influenced by nutritional status. Thus TOPRS can be used as parameters to generate output (Table 5).

Table 1: Relationship between Sex category and the patients outcome

Sex	Study subject		Total n (%)
	Died n (%)	Improved n (%)	
Male	31 (24.21%)	97 (75.78%)	128(100%)
Female	15 (16.66%)	75 (83.33%)	90 (100%)
Total	46 (21.10%)	172 (78.89%)	218 (100%)

Chi-Square = 1.81 df = 1 p =0.17(p >0.05)

Table 2: Relationship between nutritional status and the outcome of the patients

Nutritional Status	Study subject		Total
	Died n (%)	Improved n (%)	
Well nourished	13 (11.92%)	96 (88.07%)	109 (100%)
Under nourished	17 (34%)	33 (66%)	50 (100%)
Malnourished	16 (27.11%)	43 (72.88%)	59 (100%)
Total	46 (21.10%)	172 (78.89%)	218 (100%)

Chi-Square = 11.79 df = 2 p =0.003(p <0.05)

Table 3: Mean age of study subjects

Age (Years)	Study subject	
	Died n = 46	Improved n = 172
Mean	3.86	4.12
Median	0.91	2
Deviation Standard	5.43	4.84
Minimum-maximum	0.10 – 17.90	0.10 – 17.40

Mann-Whitney U, p = 0.26 (*p* >0.05)

Table 4: TOPRS Score average of Study Subjects

TOPRS score	Study subject	
	Died n = 46	Improved n = 172
Mean	3.29	0.58
Median	3.0	0
Standard intersection	0.73	0.74
Minimum-maximum	2-5	0-3

Mann-Whitney U, p=0.000 (p<0.01)

Table 5. Results of independent logistic variable regression analysis in predicting the patients outcomes

Variabel	B	S.E	Df	p	Exp (B)	95% CI
Group nutritional status B	0.61	0.56	1	0.283	1.84	0.60-5.62
TOPRS ≥2	21.98	3231.80	1	0.000	3530274583	0.00-

B : Regression Coefficience, S.E : Standar Error

Discussion

This study shows that the TOPRS score is higher in the deceased group. The TOPRS score is an independent variable, which can be used as a parameter to determine the output with p = 0.000 with (95% CI 0.00-). The TOPRS score has a predicted outcome score in the admitted patient to emergency care. The best cutting point for distinguishing two outcomes (improved or dead) is ≥ 2.

The sex correlation with the outcome of the treated patient did not differ significantly, which means that sex is not a prognostic factor. Overall, there was no significant difference by sex, but death was found more in girls. Similar with the results obtained by Faisal[9], there is no significant difference in sex with outcome of patients in Wahidin Sudirohusodo Hospital based on SICK score.

In relation to nutritional status, the incidence of SIRS and sepsis leading to death more frequently affects malnourished children. This is associated with a decrease in the antibody immune response to the presence of a worse antigen (infection) to allow for severe SIRS/ sepsis.[10]

Generally, the value of TOPRS score in patients who died is much higher than the value of the improved patients. The mean value of TOPRS score of patients in improved group was lower compared to the patients who died. It means that the role of SIRS/sepsis parameters is particularly prominent in patients who die and correlates with the weight and outcome of the disease. It occurs because of the increase of SIRS signs, the appearance of proinflammatory status characterized by tachycardia, tachypnea or hyperpnea, hypotension, hypoperfusion, oliguria, leukocytosis or leukopenia, pyrexia or hypothermia. Several molecules that signal from cell to cell are thought to be involved in proinflammatory status events include interleukin (IL) -1, IL-5, IL-6, IL-8, IL-11, IL-15, and multiple colony stimulating factors, and chemokacin (monocyte chemotactic protein-1, growth-related oncogene alpha protein). Similar findings have been made for tumor necrosis factor (TNF) -alpha and other related molecules derived from pathogenic microbes, eg lipopolysaccharides, staphylococcal enterotoxins A-E. it showed that there is no single trigger for SIRS. In other words, SIRS is a common organism response to various types of immune system challenges. SIRS can affect all organ systems and lead to MODS.[5]

TOPRS score can be used as a differentiator between groups of patients who have a good and bad prognosis. From this study it was found that the lowest cutoff point of the TOPRS score lies in the 97.5 percentile of the improved group, with the TOPRS score of 2 and the highest cutoff point lying in the 2.5 percentile of the deceased group, with the TOPRS score 3. In between the two cut off point, there are 2 cut off points, for each cut point then assessed sensitivity, specificity, positive predictive value and negative predictive value. It aims to find the best TOPRS score value in determining outpatient outcomes admitted to emergency room.

These values are then analyzed and described into the ROC curve, and it is found that the furthest point from the diagonal line and the upper left corner is the green line ie the cutoff point of the TOPRS score ≥3, which has the same under-curve (AUC) value with the cutoff point of TOPRS score score ≥2 is 0.945 or in other words from two points of this cut has the same AUC. Since both are the same, in order to establish the prognosis we choose the earlier value, TOPRS ≥2.

This cutting point has a sensitivity value of 100%, specificity 89.5%. In which, this TOPRS score has the ability to identify patients treated with a good prognosis of 100% and states have a poor prognosis of 89.5% if the score of TOPRS patients ≥2.

This point has a positive predictive value of 100%, and a negative predictive value of 74%. Positive and negative predictive values are also quite good. When applied clinically, the patients have a good prognosis if the TOPRS score is less than <2 of 100%. Patients' outcome depends on many factors, such as the type of illness, the speed of the diagnosis, and the treatment. Accumulation of these factors will lead the patient to a good or bad prognosis.

The TOPRS <2 score score limit shows very significant differences in terms of output. The odds ratio can not be calculated because there is one table cell that is zero value. The TOPRS score value (<2) has a better predictive prognosis for an earlier assessment in emergency room with the best treatment (as per clinical pathway). In contrast, patients with a TOPRS score (≥2), which means there are 2 or more abnormal (SIRS) parameters, should be wisely translated in their clinical application. The specificity of 89.5% is quite high (optimal), so that the patient with the TOPRS score ≥ 2 needs more rigorous monitoring, but does not necessarily

direct the bad outcome (death). The results of this study expose the same value, with previous studies conducted by Harmesh bain in India who found the cutoff point of TOPRS ≥2 score. In a study conducted by Gupta et al.[5], the severity of the disease assessed by the SICK score found a score of 2.5. It is also similar to Faisal's[9] result, by using a SICK score to find a cutoff point ≥2. 3.

Based on bivariate analysis, there were two variables, TOPRS score and the identified nutritional status, which had significant relationship with the outcome of the infected patient in pediatric emergency instalation. Therefore, multivariate analysis is done. From multivariate analysis showed that TOPRS score is independent variable which is not influenced by nutritional status. Thus, the TOPRS score can be used as a parameter to determine the output.

The TOPRS score can be said to reflect the severity of a disease, because every disease, has some or all of the vital signs/symptoms present in the TOPRS score. In this study, there are 4 patients who died with the score of TOPRS 2, it can be explained that the possibility due to the basic disease of each patient, which at the beginning of hospital admission is relatively mild but the history of disease/treatment experience worsening.

In conclusion, TOPRS score had a prognostic value on patient outcome in pediatric emergency instalation. The best cutting point to determine the outcome of the patient is the TOPRS score ≥2, where the result below this score is a good prognosis, after an optimum management according to the protocol.

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Cellular Phone and Laptop Radiation Effects on Subjective Complaints in Informatics Students

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Abstract

The increasing use of cell phones and laptops in today's modern society has a negative impact on health; one such impact is on informatics students, who struggle with the use of cell phones and computers in their daily activities. This study aimed to determine the relationship between radiation exposure to cell phones and laptops with subjective complaints in the form of sleep quality, headache, dry eye syndrome (DES) and concentration disorders.

The research is analytic observational and cross-sectional approaches. The study used simple random sampling to select 112 respondents, all of which were informatics students of Universitas Sebelas Maret (UNS). The Pearson correlation test results were obtained from cell phone and laptop radiation exposure with sleep quality ($p < 0.05$; $r = 0.192$), headache ($p < 0.05$; $r = 0.510$), dry eye syndrome ($p < 0.05$; $r = 0.1950$) and disturbances concentration ($p < 0.05$; $r = 0.406$).

Keywords: *Radiation exposure, sleep quality, headache, dry eye syndrome, disturbances concentration.*

Introduction

Cell phones and laptops are very essential in today's world, and their use is inevitabel. However, for all the benefits associated with their use, they also have downsides. For example, cell phones and laptops are major sources of electromagnetic pollution, which has unpleasant effects on public health. The results in 2015 showed that 54% of the world's total population or 3.996 trillion of the 7.476 trillion people on earth have cell phones, and most users are 18-34 years old[(1)], while in America, cell phone use is mostly among adolescents aged 8 to 18 years[(2)]. In 2015, cell phone use in Indonesia is currently at 56.92% of the total population[(3)]. The use of laptops has also become a lifestyle in the community, especially among students and employees. In 2013, the majority of laptop users in the UK were 14-24-year olds, and they accounted for as much as 70% of the total users[(4)]. Meanwhile, in Indonesia, the number of laptop users reached stood at 42% of the total population, and consisted mostly of students, entrepreneurs and housewives[(5)].

The increasing use of cell phones and laptops has an adverse effect on health. Based on the research in Sweden, young adult cell phone users complained of subjective complaints in the form of stress, depressive symptoms, and decreased sleep quality[(6)]. The study showed that sleep disturbances were experienced by 19.2% of students and concentration disruption was experienced by 14.5% of the students due to exposure to cell phone radiation[(7)] and an effect on the pattern of Electroencephalograph (EEG) and human sleep patterns[(8)]. Cell phone usage disrupts the pattern of sleep at night and also affects the quality of sleep if one's phone is still turned on[(9)]. Decreased sleep quality is associated with cellular phone radiation exposure due to metabolic and cardiovascular disorders which have an

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effect on the occurrence of insomnia and decreased sleep duration[10].

Exposure to cell phone radiation in the form of electromagnetic waves acutely causes headache, eye disorders, fatigue, and sleep disorders. According to the NIOSH, it is reported that 88% of those who use laptops for at least 3 hours will experience fatigue and dry eye syndrome[11]. Dry eye syndrome could be in the form of sensitive eye, feeling discomfort when exposed to bright light, the eyes feeling itchy and sandy, eye aches, blurred vision and reduced vision.

The body can recognize cell phone radiation exposure as a carrier of information that disrupts the body's metabolism and biochemical reactions by interfering with the body's physiological processes and which cause an increase in intracellular free radicals, genetic damage, inter-cell communication disorders, leakage in the blood-brain barrier, and the risk of tumor. However, exposure to radiation from cell phones does not directly causeharm to one's health, but rather triggers biochemical responses in cells so that the manifestations of the disorder usually occur for a long time, as carcinogenic and has the potential to cause interference with various organs of the body[12].

Exposure to electromagnetic radiation from cell phones can cause physical stress where the body responds by secreting hormones from the hypothalamus. Increased hormone secretion in the hypothalamus results in increased levels of glucocorticoid hormones, which increases cortisol levels and causes a decrease in the levels of HMG-CoA reductase. The decrease in the level of HMG-CoA reductase will cause a decrease in the rate of endogenous synthesis of cholesterol. A decrease in endogenous synthesis will cause a decrease in plasma cholesterol levels.

Any physical and psychological stress on the body for just a few minutes can lead to an increase in ACTH secretion. Consequently, there will be an increase in the secretion of glucocorticoids and cortisol. Glucocorticoids play an important role for catecholamines to fully implement the effect of free fatty acid mobilization. Increased secretion of glucocorticoid hormones will also increase the secretion of the hormone epinephrine which can increase the rate of lipolysis in adipose tissues, and norepinephrine, which can increase the use of circulating lipoproteins, so that cholesterol levels in the plasma will decrease. The secretion of cortisol is higher when the body is exposed to stress, both physical and psychological. Cortisol can modulate the immune system because all leukocytes have receptors for cortisol. Increased cortisol levels will cause a decrease in the levels of HMG-CoA reductase. Decreasing levels of HMG-CoA reductase will cause a decrease in the rate of endogenous synthesis of cholesterol. The decrease in endogenous synthesis will cause a decrease in cholesterol levels in the plasma which results in subjective complaints in humans[13].

Material and Method

The research is observational analytic with cross-sectional approaches to analyze the relationship between radiation exposure from cell phones and laptops with subjective complaints by students. The study utilized simple random sampling to select 112 UNS informatics students from a population of 155 students. The respondents were adjusted to the inclusion criteria in the form of UNS informatic students who used cell phones and laptops every day, while the exclusion criteria were: 1) Students who consume sleeping pills, antiarrhythmic agents, corticosteroids, diuretics, and theophylline; and 2). Students who consume coffee or soft drinks 6 hours before going to bed.

The independent variable was the duration of exposure to electromagnetic radiation from cell phones and laptops as revealed by a questionnaire, with the results indicating the average duration cell phone and laptop usage each day, expressed in minutes. The questionnaire used scale measurement in ratios.

The dependent variable was subjective complaints in the form of:1) Sleep quality, measured using the Pittsburgh Sleep Quality Index (PSQI) questionnaire which had 7 main components with a score range 0-21. A score of 0 indicates that sleep quality is getting better, while a score of 21 indicates that sleep quality is very poor. For the sake of statistical analysis, sleep quality was grouped into two, namely good sleep quality (score <5) and poor sleep quality (score> 5)[14]; 2) Headache, which was revealed using a questionnaire containing the description/degree of headache with a score range of 0-10, so that the scale of measurement was a ratio; 3) Dry eye syndrome, which was revealed using the Ocular Surface Disease Index (OSDI) questionnaire. OSDI scores were obtained using the formula: total number of scores x 25. OSDI scores were categorized into four, namely: normal (score 0-12), mild (score 13-20), moderate (score 21-32) and severe (score 33-100)[15] and 4) Headache symptoms

which was revealed by a questionnaire about headache symptoms that had undergone validation and reliability. Disturbance concentration, which was revealed using the Grid Concentration Test. Grid Concentration Test scores were categorized into two, namely: normal (score > 10), severe (score 0-10).[16] Pearson correlation test was used to determine the relationship between cell phone and laptop radiation exposure and subjective complaints, at a significance level of 0.05.

Findings:

Table 1: Distribution of repondents' characteristics

Characteristic	Amount (n)	Percentage (%)
Gender		
Male	50	44.3
Female	62	55.7
Duration of Radiation Exposure		
High (> 2 hour)	105	93.75
Low (< 2 hour)	7	6.25
Subjective complaint:		
Sleep quality		
Good	42	37.50
Bad	70	62.50
Headache		
Tense muscle headache	78	69.64
Migraine	26	23.22
Cluster	8	7.14
Dry Eye Syndrome		
Normal	27	24.10
Mild	19	16.96
Moderate	31	27.68
Severe	35	31.26
Concentration Disorder		
With	68	60.72
Without	44	39.28

Table 2: Variable correlation test for exposure to cell phone and laptop radiation and subjective complaints

Subjective Complaints Variables	Correlation Coefficient (r)	p Value
Radiation cell phones and laptops exposure with sleep quality	0.192	0.042
Radiation cell phones and laptops exposure with headache	0.510	0.000
Radiation cell phones and laptops exposure with dry eyes syndrome	0.195	0.034
Radiation cell phones and laptops exposure with concentration disturbance	0.406	0.020

Discussion

Based on research data, 93.75% of the research subjects used cell phones and laptops for more than 2 hours per day. This shows that, in terms of cell phone and laptop usage, UNS informatics students are in the high intensity category, in accordance with the research of Saxena; 57% of their respondents use cellphones and laptops for more than two hours each day.[17]

The results of the Pearson statistical test showed a significant relationship between exposure to cell phone and laptop radiation and sleep quality in UNS informatics students (p = 0.042; r = 0.192). The results of other Pearson statistical tests also show a significant relationship between exposure to radiation from cell phones and laptops and interference with concentration among UNS informatics students (p = 0.020; r = 0.406). This situation is consistent with the research in which there was a positive correlation between cellphone use and deteriorating sleep quality among medical students[16]. Exposure to radiation from cell phones and laptops can disrupt the diurnal rhythm; reduce the production of melatonin hormone in the pineal gland which can reduce sleep onset, thereby reducing sleep; and encourage the secretion of cortisol hormone which can affect the metabolic cycle, the sleep-wake cycle, and of sleep quality in the REM phase.[18]

Concentration is defined as a person's ability to maintain attention in a long period. Attention involves parts of the brain called alerting, orienting, and attention executives.[19] Orienting as a process of directing attention to sources of stimulation involving visual orienting functions. The anatomical structure associated with orienting is the parietal and frontal lobes which produce neurotransmitters acetylcholin and play a role in the process of orienting. The function of acetylcholin is to help communicate between the nerves and muscles of the eye and the process of storing and recalling memories and attention. Physical environment such as radiation exposure can affect the production of acetylcholin so that it can cause interference with concentration in a person.

The results of the Pearson statistical test showed a significant relationship between radiation exposure to cell phones and laptops and headache among UNS informatics students (p = 0.000; r = 0.510). The resulting headache is related to the occurrence of electrical hypersensitivity resulting from oxidative damage in brain cells. Brain cells will change the electrical activity of the brain, followed by changes in the blood-brain

barrier permeability, resulting in the disruption of the active transport of Na+ and K+ ions, and the release of Ca ++ ions by cellular membranes.[20] When the cell experiences stress, there is a regulatory disorder so that the Ca ++ ion undergoes regulation opposite to that of Ca ++ ions going into the cell and triggering focal ischemics in the brain region, thus causing complaints of headache.[21] The exposure to radiation for one hour caused a stress response to the cell endothelium in the form of a change in phosphorylation status of certain types of proteins namely Heat shock protein 27 (Hsp 27). This will facilitate the elements of albumin, ions, metal, chemicals and viruses to pass through so that microedema and inflammation occur, thus causing complaints of headache.[22]

The results of the Pearson statistical test showed a significant relationship between exposure to radiation from cell phones and laptops and the incidence of dry eye among UNS informatics students ($p = 0.034$; $r = 0.195$). This is consistent which states that dry eye syndrome results from continuous radiation exposure to the eye, resulting in hyperosmolarity in the tear layer, which causes irrigation in the eyeball to be disrupted, thus causing inflammation on the eye surface.[21],[23] The severity of dry eye syndrome can be influenced by different eye distances to the monitor, as well as the brightness level of the monitor and the different light conditions around the location.[24] Exposure to cell phone radiation increases the concentration of free radicals such as reactivity oxygen species (ROS) in cells. The high level of ROS results in oxidative stress and injury to the cell, namely Lipid peroxidation in membranes is characterized by increased levels of malondialdhyde (MDA).(21) Long radiation exposure can cause damage to cell structures, resulting in decreased function and death of cells.[25]

Conclusion

Exposure to electromagnetic radiation from cell phones and laptops causes subjective complaints such as decreased sleep quality, headache, dry eye syndrome and impaired concentration among UNS informatics students.

Conflict-of-Interests Statement: The authors declare that there are no competing or potential conflicts of interest.

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Comparing the Effectiveness of Video-Assisted Teaching and Simulation on Nurses' Knowledge in Performing Cardiopulmonary Resuscitation

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Abstract

Cardiac arrest is one of the main health problems in the world with high mortality rate. The problem requires quality and comprehensive treatment at the hospital especially in the process of performing cardiopulmonary resuscitation. Quality and comprehensive cardiopulmonary resuscitation must be performed by nurses with adequate knowledge about cardiac arrest. This knowledge may be obtained through simulation-based and technology-based training such a *video-assisted teaching.* The objective of the study was to compare the effect of training using *video-assisted teaching* and simulation on nurses' knowledge of performing cardiopulmonary resuscitation. The study used quasi-experimental design and *pretest-posttest with control group* approach. There were 42 respondents who were divided into 2 groups. Knowledge was measured before and after trainings. Data were analyzed using *Wilcoxon* and *Mann Whitney* tests. Result of the study indicated that there was difference in nurses' knowledge between before and after training using video-assisted teaching and simulation with p-value of 0.000. However, there was no difference in nurses' knowledge after training using video-assisted teaching and simulation with p-value of 0.372. Thus, training using video-assisted teaching and simulation may increase knowledge about performing cardiopulmonary resuscitation although there was no difference in knowledge score between the video-assisted teaching group and the simulation group.

Keywords: *Cardiopulmonary Resuscitation knowledge, Video Assisted Teaching, Simulation.*

Introduction

Emergency cases such as *In-Hospital Cardiac Arrest* (IHCA) happen suddenly and require rapid, correct, and accurate response. IHCA is a case of cardiac arrest that occurs at the hospital[1].

Data from the *World Health Organization* (WHO) indicated that cardiac arrest is the leading cause of death both in developed and developing countries, accounting for 60% of the total number of death[2]. Mortality rate of IHCA in the United States is predicted at 200.000 cases every year[3]. According to Girotra *et al* mortality rate of in-hospital cardiac arrest (IHCA) reached 23.1% [4]. In-hospital patients who survived in-hospital *cardiac arrest* was around 20% [5]. In Indonesia, the prevalence of coronary heart disease reached 883.447 or about 0.5% of the total number of population, while the number of patients diagnosed with coronary heart disease was higher at 1.5% or about 883.447. There were 375.127 patients with coronary heart disease in East Java Province or around 1.3% of the population[6].

AHA recommended quality cardiopulmonary resuscitation as a solution to decrease the rate of sudden cardiac death. Cardiopulmonary resuscitation (CPR) is a procedure to maintain and restore heart and lung functions by administering chest compression and

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artificial breathing[7]. This procedure becomes the focus in the effort to prevent sudden cardiac death by health professionals[4].

Since health professionals plays key role in increasing patients' health status and quality of life, they need to have better knowledge to support their skills in providing health services[8]. Therefore, as health professionals, nurses should increase their knowledge and skills[9].

Nurses play a key role in preventing worse prognosis of cardiac arrest. Factors contributing to nurses' ability to prevent the worsening of prognosis are levels of knowledge, skills, and motivation. Knowledge can be increased using nursing education. Nursing education is an effort to apply knowledge about health into skills through learning process[10, 11]. The ability to rapidly and effectively respond to cardiac arrest lies in nurses' competency in managing cardiac arrest. Limited skill in cardiac arrest management i.e., inability to perform resuscitation may worsen cardiac arrest[12].

Studies show that there is a relationship between nurses' knowledge and skills. Knowledge will have an effect on nurses' skill in delivering nursing care[13]. Improving nurses' knowledge about cardiopulmonary resuscitation may be done by providing them with education and training. Farshi *et al* (2012) stated that training for nurses may be delivered using traditional method such as simulation or non-traditional one such as technology-based learning[14]. Hadid and Suleiman (2012) claimed that simulation may improve nurses' knowledge and skills in performing cardiopulmonary resuscitation[15]. Similar previous study also showed that there was a significant difference between pretest and posttest result on group trained using simulation when compared with pretest and posttest result of group trained using traditional lecture method[16].

Sadeghi *et al* (2014) stated that besides simulation, teachers may also use technology-based method such as video-assisted teaching to facilitate learning. Both method, however, have their weakness and strength[17]. In general, simulation is a favored method in teaching cardiopulmonary resuscitation to health care professionals and the general public because this method is more interactive. Moreover, during simulation, learners find it easier to ask questions directly to the facilitators. Unfortunately, simulation is time consuming and needs a lot of space in its implementation. Meanwhile, when learning through video-assisted teaching, learners are more independent and have greater freedom with learning time as they are free to decide when they want to learn. In addition, video-assisted teaching provides a consistent learning material for the learners which facilitates better learning. This method may become an innovative solution to simulation method to increase nurses' knowledge[18].

The preliminary study found that in 2017 there were 117 cases of cardiac arrest requiring immediate response in resuscitation room and ICU of dr. Slamet Martodirdjo Regional General Hospital (RSUD) Pamekasan. The total number of patients with heart disease from January until September 2018 was 1187 with a mortality rate of 40% of the total in patients. From January to August 2018, the number of cardiac arrest incidence was 104 with a high mortality rate of 71 deaths.

The preliminary study also found that not all nurses performed cardiac arrest management as some of the ICU or Emergency Departement nurse did not know how to manage cardiac arrest. The Regional General Hospital on dr. H. Slamet Martodirdjo had already had a *Code Blue* team although its implementation had not been maximum. The result of interview and observation of 10 ICU and Emergency nurses indicated that 90% of cardiac arrest management had not conformed to the recommended AHA 2015 algorithm. Some of the nurses had not known *Ventricular Tachycardia* (VT) or *Ventricular Fibrilation* (VF) rhythm and *Asistole* or *Pulseless Electric Activity* (PEA). Consequently, when treating VT/VF *cardiac arrest,* they only performed cardiopulmonary resuscitation, without defibrillation. This may contribute to the high mortality rate of patients with cardiac arrest. The preliminary study also discovered that dr. H. Slamet Martodirdjo Regional General Hospital Pamekasan had not had SOP for the management of patients with cardiac arrest.

Based on these conditions, the researcher was interested in comparing the effectiveness *video-assisted teaching* and simulation in increasing nurses' knowledge in performing cardiopulmonary resuscitation.

Method And Material

The study used quasi-experimental design with pretest-posttest with control group approach. There were 42 respondents, nurses of dr. Slamet Martodirdjo Regional General Hospital Pamekasan, who were divided into video-assisted teaching group and simulation group.

The video used by the researcher in video-assisted teaching group was in compliance with 2015 AHA guidelines and the simulation was delivered by an instructor with AHA license. The video had a duration of about 10 minutes, while the simulation was around 10-20 minutes in length.

The inclusive criteria for the respondents were nurses who had at least 2 years working experience, had performed cardiac arrest management, and were willing to become a respondent for the study. Nurses' knowledge was measured using questionnaire. The validity and reliability of the questionnaire were tested using cronbach' alpha with a value of 0.988. Knowledge was measured before and after intervention. Bivariate analysis was done using Wilcoxon and Mann Whitney test. The study was conducted after obtaining ethical clearance from the ethical commission ofdr. Slamet Martodirdjo Regional General Hospital Pamekasan.

Results

Univariate:

Table 1: Respondents' Characteristics by Age, Working Experience, and Knowledge Score

	Mean	Median	Min-Max	SD
Age	34.74	33	25-55	7.245
Working experience	12.26	10	4-28	6.56
Knowledge Score				
• Pre	7.98	8	6-10	1.334
• Post	12.6	12.5	11-14	0.912

Table 1 shows that the youngest age was 25 years old and the oldest one was 55 years old with a median value of 33. The longest working experience was 28 years and the shortest one was 4 years with a median value of 10. The highest knowledge score before intervention was 10 and the lowest one was 6 with a median value of 8. The highest knowledge score after intervention was 14 and the lowest one was 11 with a median value of 12.5.

Table 2: Respondent's General Characteristics by Sex, Education, and Competency

No	Variable	Category	f	%
1	Sex	Male	25	59.5
		Female	17	40.5
2	Education	Diploma 3 (Associate Degree)	28	66.7
		Bachelor+Ners	14	33.3
3	Competency	BLS	42	100
Total			42	100

Table 2 shows that the number of male respondents was higher than female ones, with 25 and 17 respectively. There were more respondents who held a diploma 3 degree (28 respondents. All respondents had BLS competency.

Table 3: Score Change in of Nurses' Knowledge in Managing Cardiac Arrest before and after Video Assisted Teaching

Measurement	Median (Min-Max)	p
Score before Intervention	8 (6-10)	0.000
Score after Intervention	12 (11-14)	

Table 3 shows a p value of 0.000 ($p<0.005$). Therefore, it can be concluded that there was a change in knowledge score between before and after intervention using *video assisted teaching*.

Table 4: Score Change in of Nurses' Knowledge in Managing Cardiac Arrest before and after Simulation

Measurement	Median (Min-Max)	p
Score before Intervention	8 (6-10)	0.000
Score after Intervention	13 (12-14)	

Table 4 shows a p value of 0.000 ($p<0.005$). Therefore, we can conclude that there was a change in nurses' knowledge score between before and after intervention using simulation.

Table 5. Comparison between Knowledge Scores Before and After Intervention using Video-assisted Teaching and Simulation

Group	Median	Min-Max	p
Video	5	3-5	0.372
Simulation	5	4-6	

Table 5 indicates a p value of 0.327. Therefore, there was no score difference between before and after intervention with video-assisted teaching and simulation. In other words, nurses' score knowledge about managing cardiac arrest in dr. H. Slamet Martodirdjo Regional General Hospital Pamekasan before and after intervention with video-assisted teaching and simulation was quite similar.

Discussion

The result shows that there was a difference in knowledge score before and after intervention using *video-assisted teaching*.

This result is also supported by Jance, Cheetham and Baumgartner (2009) who maintained that learning process using method which is based on advanced technology increases prefrontal cortex activation in the human brain. Increased activation of prefrontal cortex triggers cognitive stimulation and strengthen memory recall[19].

Technology-based learning process provides a learnered-centered learning in managing information process to improve cognitive skill in accordance with the desired objective. The learning process can be done autonomously with available supporting technology [11].

The study also showed that there was a difference in nurses' knowledge score between before and after intervention using simulation.

This result is also in line with study by Everett-Thomas *et al* (2016) which showed that there was an increase in knowledge score of cardiopulmonary resuscitation performance after simulation. The increase in knowledge was in the form of better quality cardiopulmonary resuscitation which was reflected in its compression rate as well as precise compression depth and position [20].

However, the study did not find a difference in nurses' knowledge score after being trained using video-assisted teaching and simulation.

This finding is in line with a study by Hsieh *et al* (2016) which showed that the result of training of cardiac arrest management using *video assisted teaching* was not significantly different from that using simulation. Both method increase knowledge score through its own mechanism[21]. However, previously study also suggested that there was a difference in the knowledge of performing cardiopulmonary resuscitation between with-instructor group and without-instructor group in which the latter group gained higher score than the former one. Respondents in without-instructor group were given freedom in learning about quality cardiopulmonary resuscitation in various ways, so their knowledge score was higher than the knowledge score of respondents in with-instructor group[22].

Every method increase respondents' knowledge in different way. Video-assisted teaching works by creating *audio imaginary* effect. The effect increases long-term memory retention and facilitates memory recall[23].

This result is also supported by Jance, Cheetham and Baumgartner (2009) who maintained that learning process using method based on advanced technology increases prefrontal cortex activation in the human brain. Increased activation of prefrontal cortex triggers cognitive stimulation and strengthen memory recall[19].

Simulation increase respondents' knowledge by promoting critical thinking in the process of solving a problem[16,24]. Cheng *et al* (2018) also maintains that cases given in a simulation will encourage the respondents to analyze the problem which will increase the respondents' knowledge through critical thinking[25]. Further, respondents also find it easy to learn about cardiac arrest management with the help of facilitators who are knowledgeable about cardiopulmonary resuscitation[20].

Based on the above explanation, we can conclude that there was no difference in nurses' knowledge score of cardiac arrest management between video-assisted teaching and simulation. Each method may increase knowledge though different mechanism.

Conclusion

In summary, there was a change in nurses' knowledge of performing cardiopulmonary resuscitation after training using video-assisted teaching and simulation. However, there was no difference in knowledge between the video-assisted teaching group and the simulation group.

Conflict of Interest: None

Ethical Clearence: This study has passed the ethical test held at General Hospital of dr. Slamet Martodirdjo Pamekasan with no 070/217/432.603/2019

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Association of Exon Deletion of MXI1 Gene with Cervical Abnormalities and Cancers Incidence in Some Iraqi Married Women

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Abstract

Cervical cancer is one of the most frequently diagnosed malignancies representing the fourth leading cause of cancer-related death in females' worldwide, with approximately 500,000 new cases diagnosed and 280,000 deaths occurring each year. Mxi1, an antagonist of c-Myc, maps to human chromosome 10q24-q25, a region altered in a substantial fraction of prostate tumors, in prostate cancer, where a high frequency of loss and mutation of the *MXI1* gene has been reported. The aim of present study was to find out the possible association of exon deletion of MXI1 gene with incidence of cervical abnormalities and cancers in some Iraqi married women. The present study include collection of 120 scraping cervical cells samples from women clinically diagnosed with cervical abnormalities and cancer, and 30 scraping cervical cells samples from apparently healthy women and all these samples were submitted for cytological and histopathological examination. DNA was extracted from all these samples, and then the singleplex PCR was performed with primers targeted the exon1, 2, 3, 4, 5 and 6 of MXI1 gene.The results of cytological examination showed that 30(25%), 21(17.5%), 15(12.5%), 11(9.16%), 2(1.66%), 1(0.83%), 22(18.33%) and 18(15%) out of 120 scraping cervical cells samples were detected for ASCUS, LSIL, HSIL, SCC, AGUS, cervicitis, and cervicitis with squamous metaplatia, respectively. Also the results of histopathological examination showed that 32(26.66%), 19(15.83%), 17(14.16%), 11(9.16%), 1(0.83%), 22(18.33%) and 18(15%) out of scraping cervical cells samples were detected for CINI, CINII, CINIII, SCC, adenocarcinoma, cervicitis, and cervicitis with squamous metaplatia, respectively. The results of singleplex PCR revealed that the positive singleplex PCR samples were identified by presence of 240, 140, 210, 200, 260, 300 bp amplicons of the exon1, 2, 3, 4, 5 and 6 of MXI1 gene respectively. The PCR results exhibited that 57(47.5%) out of 120 scraping cervical cells samples were showed deletion in the exon5 represented by 22(38.59%), 11(19.29%), 8(14.03%), 7(12.28%) and 9(15.78%) out of 57 positive deletion samples that were detected for ASCUS, CINI, CINII, CINIII and SCC, respectively. In addition, the results showed that 22(73.33%) out of 30 ASCUS, 11(34.37%) out of 32 CINI, 8(42.1%) out of 19 CINII, 7(41.17%) out of 17 CINIII, and 9(81.81%) out of 11 SCC were had exon5 deletion. Whereas 63(52.5%) out of 120 scraping cervical cells samples were didn't show any deletion in the exon5 of MXI1 gene.

Conclusion: The exon deletion of MXI1 gene was clearly associated with the exon5, whereas other exons of MXI1 gene didn't show any deletion, and the results revealed there was remarkable association between the exon5 deletion and the incidence of precancerous stages include ASCUS, CINI, CINII, CINIII and cancerous stage represented by SCC.

Keywords: *Cervical abnormalities, cervical cancer, married women, MXI1 gene.*

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Introduction

Cervical cancer is the third most common cancer worldwide and a major fatal malignancy among women, causing about 275,000 deaths annually worldwide, mostly in developing countries. It can be a preventable

disease if identified at its early (precancerous) stages and treated by ablation[1,2]. Max interactor 1 gene (MXI1) is a transcription factor that belongs to the mad family of Myc antagonists, which encode proteins that are highly homologous to c-Myc. Mxi1 opposes the growth-promoting activity of c-Myc by repressing transcription of c-Myc activated target genes. Mxi1 inhibits the ability of c-Myc to transform cells in vitro, and its expression is associated with cellular differentiation[3]. The MXI1 gene has been localized to chromosome 10q24-25 [4], a region demonstrating deletions or rearrangements in 60-97% of human glioblastomas and up to 30% of human prostate cancers. Although loss of heterozygosity for MXI1 is seen in a substantial fraction of glioblastoma tumors (64%), no MXI1 coding sequence mutations have been seen in these tumors [5]. Furthermore, a majority of studies have failed to demonstrate MXI1 mutations in prostate tumors[6]. By counteracting c-Myc, MXI1 functions as a growth suppressor, resulting in reduced cell proliferation in vitro [4,5,7], previously localized the human MXI1 gene to chromosome 10q24-q25. Deletions resulting in loss of alleles in this region of chromosome 10 are observed in 30±50% of human prostate tumors[8].

Materials and Method

Samples Collection: During the period of study, from beginning of March 2017 to the end of September 2017. 120 scraping cervical cells samples were collected from Iraqi women clinically diagnosed with cervical abnormalities and cancer, and 30 scraping cervical cells samples from apparently healthy women who attended to Baghdad Medical City and Al-Elwiya Maternity Teaching Hospitals in Baghdad City, Patients' ages ranged from 20 to 70 years of age. This study was carried out after obtaining the approval from the Institute of Genetic Engineering and Biotechnology for Post Graduate Studies/Baghdad University and Ministry of Health/Iraq.

Extraction of DNA: The DNA was extracted from scraping cervical cell samples using DNA-Sorb-A nucleic acid extraction kit (Sacace Biotechnologies/ Italy), according to the manufacturer's instructions.

Agarose gel electrophoresis: After extraction of DNA carrying out, agarose gel electrophoresis was adopted to confirm the presence and integrity extracted genomic DNA [9].

Detection of MXI1 gene by using PCR: The PCR was adopted to detect the exons 1, 2, 3, 4, 5 and 6 of MXI1 gene in the extracted DNA of scraping cervical cells from clinically diagnosed women with cervical cancer. To select PCR primers that can give specific amplification for exons 1, 2, 3, 4, 5 and 6 of MXI1 gene. The (MXE1-F/MXE1-R) for exon 1, (MXE2-F/ MXE2-R) for exon 2, (MXE4-F/MXE4-R) for exon 4, (MXE5-F/MXE5-R) for exon 5, (MXE6-F/MXE6-R) for exon 6, were used according to [10], the (MXE3-F/ MXE3-R) for exon 3 was used according to [11]. The general properties of these primers were checked by using Oligocalc Oligonucleotide Porperties Calculator program, the name and sequence of these primers are listed below in table (1).

Table (1): The name, sequence and product size of PCR primers for exons of MXI1 gene.

Name of Primer	Sequece of Primer 5'-3'	Size of Product (bp)
MXE1-F	ATGGAGCGGGTGAAGATGAT	240
MXE1-R	GCACTGCCGAAAAAGATTAG	
MXE2-F	GGGTCAATGGATTTGGGTAC	140
MXE2-R	TAAGCGTTCCCAGCTTGCTA	
MXE3-F	GCAACAAAGCATGGCTAATG	210
MXE3-R	TTCACAATGGGCTATACATCTGA	
MXE4-F	TAACCAGACTGTGCTGATTTG	200
MXE4-R	ACCAGAACTGAGGGAATTGTG	
MXE5-F	TGTTTGTACTGGACTATACAC	260
MXE5-R	ATGTTTAGTATTTCATTAGAGAAG	
MXE6-F	GTTAGTTTTTGAAGGTGCGC	300
MXE6-R	TGTTATGTCATGCTGGGTTC	

The PCR reactions for detection of exons of MXI1 gene were performed in 25 µl volumes containing, amplification of exons of MXI1 gene was carried out with initial denaturation at 94°C for 1 minutes, followed by 35 cycles of denaturation at 94°C for 30 seconds, annealing at 66, 65, 55, 66, 65 and 56°C for F and R primers of exons1, 2, 3, 4, 5 and 6 respectively for 1 minute, and extension at 72°C for 1 minutes. The thermal cycles were terminated by a final extension for 5 minutes at 72°C [(11)]. The PCR products were resolved by electrophoresis. Chi-square test was used to significant compare between percentage (0.05 and 0.01 probability) in this study[(12)].

Results

Agarose gel electrophoresis was adopted to confirm the presence and integrity of the extracted DNA**.** The results of PCR showed that samples of present study gave positive result for PCR of exon 1, 2, 3, 4, and 6 of MXI1gene products with 240, 140, 210, 200 and 300 bp molecular weight, whereas no amplification was observed with exon 5 (260bp) in 57 out of 120 samples and negative control (Figures 1).

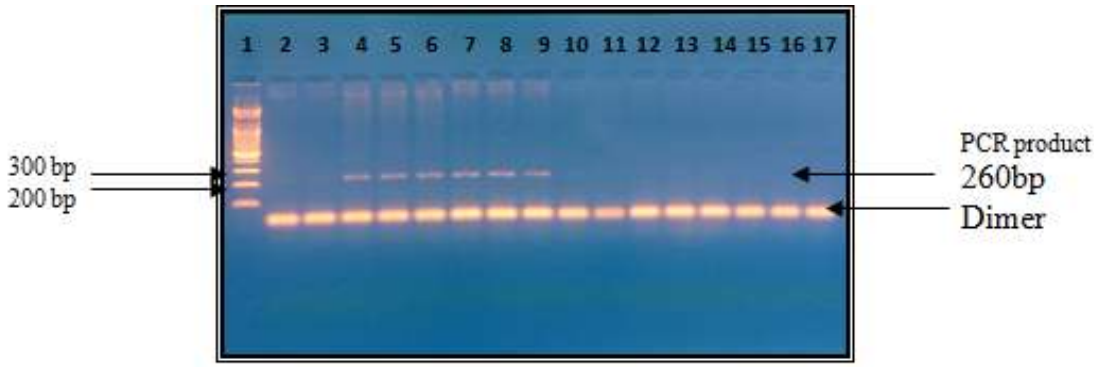

Figure (1): Gel electrophoresis of singlplex PCR products of exon 5 of MXI1 gene on 1.5% agarose gel at 10volt/cm for 1 hour. Lane 1: 100 bp DNA ladder, lane 2-17: PCR products of exon 5.

The patient group was divided to eight groups according to cytology examination; i) Atypical squamous cells of undetermined significance (ASCUS) 30 samples, ii) low grade squamous intraepthelial lesion LSIL 21 samples, iii) high grade squamous intraepthelial lesion HSIL 15 samples, iv) squamous cervical cancer 11 samples, v) atypical glandular cells of undetermined significance 2 samples, vi) adenocarcinoma 1 sample, vii) cervicitis 22 samples, and viii) cervicitis with squamous metaplatia 18 samples. The samples were also including 30 specimens (scraping cervical cells) of healthy women used as a control (Table 2).

Table (2): Distribution of samples study according to cytological examination.

Cytological Examination	No. of Cases	Percentage of Cases (%)
ASCUS	30	25.00
LSIL	21	17.50
HSIL	15	12.50
Squamous cervical cancer	11	9.16
AGUS	2	1.66
Adenocarcinoma	1	0.83
Cervicitis	22	18.33
Cervicitis with squamous metaplasia	18	15.00
Total	120	100%
Chi-square value	---	9.074 **
P-value	---	0.0005

** (P<0.01).

ASCUS: Atypical squamous cells of undetermined significance, **LSIL:** Low-grade squamous intraepithelial lesion, **HSIL:** High-grade squamous intraepithelial lesion. **AGUS:** atypical glandular cells of undetermined significance.

Also the results of histopathological examination showed that 32(26.66%), 19(15.83%), 17(14.16%), 11(9.16%), 1(0.83%), 22(18.33%) and 18(15%) out of scraping cervical cells samples were detected for CINI, CINII, CINIII, SCC, adenocarcinoma, cervicitis, and cervicitis with squamous metaplatia, respectively (Table 3).

Table (3): The distribution of sample study according to the histopathological examination.

Histological Examination	No. of Case	Percentage of Case (%)
CIN I	32	26.66
CIN II	19	15.83
CIN III	17	14.16
Squamous cervical cancer	11	9.16
Adenocarcinoma	1	0.83
Cervicitis	22	18.33
Cervicitis with squamous metaplasia	18	15.00
Total	120	100%
Chi-square value	---	9.261 **
P-value	---	0.0003

** (P<0.01).

CIN: Cervical intraepithelial neoplasia.

A total of 120 cases of cervical abnormalities were studied, the MXI1 deletion were identified in 57/120 (47.5%) and 63/120 (52.5%) not deleted table (4).

Table (4): Distribution of the study sample according to deletion of exon5 of MXI1.

PCR	Number	Percentage (%)
Positive	57	47.5
Negative	63	52.5
Total	120	100%
Chi-square value	---	2.071 NS
P-value	---	0.0966

NS: Non-Significant.

The PCR results exhibited that 57(47.5%) out of 120 scraping cervical cells samples were showed deletion in the exon5 represented by 22(38.59%), 11(19.29%), 8(14.03%), 7(12.28%) and 9(15.78%) out of 57 positive deletion samples that were detected for ASCUS, CINI, CINII, CINIII and SCC, respectively (Table 5).

Table (5): Correlation samples of study and deletion of exon5 of MXI1 according histopathological examinatin

Cytology	Number	Percentage (%)
ASC-US	22	38.59
CINI	11	19.29
CINII	8	14.03
CINIII	7	12.28
Squamous cervical cancer	9	15.78
Total	57	100%
Chi-square value	---	6.944 **
P-value	---	0.0078

** (P<0.01).

In addition, the results showed that 22(73.33%) out of 30 ASCUS, 11(34.37%) out of 32 CINI, 8(42.1%) out of 19 CINII, 7(41.17%) out of 17 CINIII, and 9(81.81%) out of 11 SCC were had exon5 deletion.

Discussion

Extension of our study to include *MXI1,* located at 10q24-45, identified mutations in 2 cell lines but no detectable change in exon sequences of this gene in bladder tumors. This finding is consistent with *MXI1* mapping outside of the critical region of loss on 10q in bladder tumors (13), where mutations in *MXI1* do not play a role in urothelial neoplastic progression. These results contrast with observations in prostate cancer, where a high frequency of loss and mutation of the *MXI1* gene has been reported (6).

Wang and colleges have found no evidence for loss or mutation of *MXI1* in bladder tumors, in contrast to findings in prostate carcinomas (11). We have found deletion in MXI1 gene in precancerous stages of cervical cancer in Iraqi married women.

Conclusion

Presence of exon deletion in exon5 of MXI1 gene whereas other 5 exons didn't show any deletion in scraping cervical cell samples that collected from some Iraqi women clinically diagnosed with cervical abnormalities and cancers.

The exon5 deletion was found with high variable percentage in precancerous stages included ASCUS, CINI, CINII, CINIII and cancer stage represented by SCC. whereas the exon5 deletion didn't present in cervicitis and Cervicitis with squamous metaplasia as well as the result revealed high (81.81%) incidence of exon 5 deletion in SCC comparing with other precancerous stage include ASCUS, CINI, CINII, CINIII.

According several points that mention above can be conclude that there is a strong association between the exon5 deletion and the incidence in cervical abnormalities and squamous cervical cancer in marred women which can refer to possible use the exon5 deletion of MXI1 gene as early molecular marker for

cervical abnormalities and squamous cervical cancer detection in marred women.

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required.

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Curcumin and 6-Shogaol Increase Hemoglobin F Levels by Inhibiting Expression of STAT3 mRNA Gene in K562 Line Cell

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Abstract

One of the approaches for beta-thalassemia therapy is the induction of the Haemoglobin F (Hb F). Curcumin and 6-Shogaol are empirically known to induce HbF, but the signalling cascade has not been widely explained. This study aims to uncover the potential of Curcumin and 6-shogaol in inhibiting the expression of STAT3 mRNA gene. This study uses the K562 erythroleukemic line cell model with an experimental design post-test only with a control group. There are 5 groups, each group has 3 replications, named the control group without treatment, the positive control group with Hydroxyurea treatment (75 μM), the combination treatment group of Curcumin (2 μM) and 6-Shogaol (10 μM), the single curcumin (2 μM) treatment group and a single 6-Shogaol (10 μM) treatment group. Test samples were taken in 72-h and 96-h time series, then RNA extraction from the cell line was continued by cDNA synthesis. The expression of STAT3 mRNA gene was measured using the qRT-PCR technique; then, the Hb F level was measured by the ELISA method. Statistical analysis using ANOVA test with significance level $p < 0.05$. In the 72-h time series, there was a significant decrease in STAT3 Gena mRNA expression ($p < 0.05$). The lowest single curcumin group ($p < 0.01$) followed by a single 6-Shogaol group ($p < 0.05$) compared to the untreated control group, while the positive control group with hydroxyurea treatment and the Curcumin and 6-shogaol combination treatment groups are not significant. Hb F levels, there was an increase in 96-h time series ($p < 0.05$) respectively from highest to lowest in the curcumin group ($p < 0.05$), 6-shogaol ($p > 0.05$) compared to the control group, but in the positive control group ($p > 0.05$) and the combination group ($p > 0.05$) it is lower than the control group without any treatment.Curcumin and 6-shogaol increase Hb F levels through inhibition expression of STAT3 mRNA Gene on K562 cells. The results of this study could be the basis for further research in vivo to reveal the signalling pathway in Hb Finduction therapy.

Keywords: *Curcumin, 6-shogaol, STAT3 Gena mRNA, Hemoglobin F, K562 cells.*

Introduction

β-Thalassemia is a group of heterogeneous recessive autosomal hereditary genetic diseases associated with point mutation or small deletion resulting in the absence or reduction of β-globin chain protein synthesis, resulting in haemoglobin deficiency. There are alternative therapies that can be developed to overcome the severity of this disease by inducing Fetal Haemoglobin (Hb F). The globin-ϒ chain, which is similar to the globin-β chain, is produced during pregnancy when it joins with globin-α chain, is to form Fetal Hemoglobin ($\alpha_2\Upsilon_2$). Hence, one of the potential current therapeutic approaches to haematological disorders, including β-thalassemia, is the stimulation of induction of fetal haemoglobin production [1-4].

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One of the transcription factors that play a role in the production of Hemoglobin F is the phosphorylated STAT3 protein. This protein, which is the dominant-negative regulator, which acts in the 5'-untranslated globin-ϒ promoter region bound to AϒSTAT3, thus inhibiting the expression of globin-ϒ-dependent concentrations [5]. Therefore, it is necessary to have a potential inhibitor to STAT3 in the framework of globin-ϒ induction. Curcumin is a STAT3 inhibitor in the SH2 domain. Inhibition of the SH2 domain, not only disrupts activation but also dimerization of transcription factors [6]. Other active compounds of herbal ingredients that have molecular targets related to the regulation of Hemoglobin F are Shogaol. 6-shogaol is the most potent inhibitor of STAT3 activation when compared to analogues such as 6-gingerol, 8-gingerol and 10-gingerol [7]. The purpose of this study was to uncover the potential of Curcumin and 6-shogaol on the expression of STAT3 mRNA as one of the induction signals for Hemoglobin F.

Material and Method

1. **Provision of Curcumin and 6-shogaol and Hydroxyurea:** Curcumin (BioBasic, Canada) with > 95% of purity, 6-shogaol (Fortopchem, China) with >98% purity and Hydroxyurea (HU) (Sigma-Aldrich, USA) with approx >98% of purity. Curcumin, HU and 6-shogaol are dissolved in 100% dimethyl sulfoxide (DMSO) to reaches the final concentration of curcumin 271,000 µM, 6-Shogaol 361,000 µM, and HU 1,315,000 µM as a stock solution, then stored at -20ºC.

2. **K562 Cell Culture:** Erythroleukemia K562 cells obtained from CANCER CHEMOPREVENTION RESEARCH CENTER (CCRC) Faculty of Pharmacy in the University of Gadjah Mada was cultured with RPMI 1640 supplementary media (without phenol red) with 10% Fetal Bovine Serum (FBS) and 50 U/ml - 50 µg/ml penicillin-streptomycin (pen-strep). Culture was maintained under atmospheric humidity with 95% air/5% CO_2 at 37ºC with cell densities between 2 x 104 to 1 x 105 cells/ml.

3. **Cytotoxic test with MTT method assay 24 hours, 48 hours and 72 hours:** Cytotoxic tests were performed to obtain IC_{50} values following the protocol of CCRC Faculty of Pharmacy in the University of Gadjah Mada. The results of the IC_{50} values of each sample were taken from 24 hours, 48 hours and 72 hours incubation. The IC^{50} values obtained were 60 µM curcumin, 40 µM 6-shogaol and 300 µM HU, respectively.

4. **Combination Test:** K562 cells were distributed into 96 wells as much as 100 µL and incubated for 24 hours. Enter the Curcumin and 6-shogaol concentration series into the wells of 50 µL with five series of concentrations each consisting of ½ IC_{50}, ¼ IC_{50}, 1/8 IC_{50}, 1/16 IC_{50} and 1/32 IC_{50}. Incubation for 24 hours. Cells were counted by using a haemocytometer so that the number of living and dead cells in each well was obtained. The highest number of living cells is an indicator of the best combination dose, named Curcumin 2 µM, 6-shogaol 10 µM, and for HU it is determined by treatment of 75 µM (¼ IC_{50}).

5. **ELISA test to measure Hb F levels:** K562 cells that have been given the appropriate treatment in their groups are then carried out protein extraction by the procedure of the M-PER Kit (Thermo Scientific, USA). The lysate obtained was used for examination of Hb F levels measured by the Human HBF Cat ELISA kit. No: EH3213 (Fine Test, China) according to the manufacturer's instructions.

6. **Analysis of STAT3 Gena mRNA expression:** Total K562 RNA cells were extracted at different times depending on the treatment, using # RB100 (Geneaid, Taiwan), 1 µg of total RNA from each sample was carried out reverse transcripts to cDNA using the cDNA Synthesis Kit (Toyobo, Japan). Real-time PCR is done by machine (ABs) using the SensiFAST SYBR Lo-ROX Kit (Bioline, Germany). The relative mRNA levels of the target gene are normalized to the mean of the internal control gene, β-Actin.

   Primary mRNA with STAT3, forward: 5'-ATC ACG CCT TCT ACA GAC TGC-3 ', reverse: 5'-CAT CCT GGA TCT CTA CCA CT-3 '. β-ACTIN forward: 5 '-ACG GCC AGG TCA TCA CCA TTG-3', reverse: 5 '-GGC GTA CAG GTC TTT GCG GAT-3 TT'. The STAT3 gene expression between treated and untreated samples was calculated as $2^{-\Delta\Delta Ct}$ relatively to the reference gene, β-actin.

7. **Statistic analysis:** Data is displayed in mean ± SD and statistical analysis using one way ANOVA test followed by post hoc LSD. The test results are considered significant if $p < 0.05$ and 95% confidence intervals.

Findings: In this study, the impact of Curcumin, 6-shogaol and their combination on the interpretation of STAT3 mRNA expression were measured by the qRT-PCR method, and the results can be seen in Figure 1.

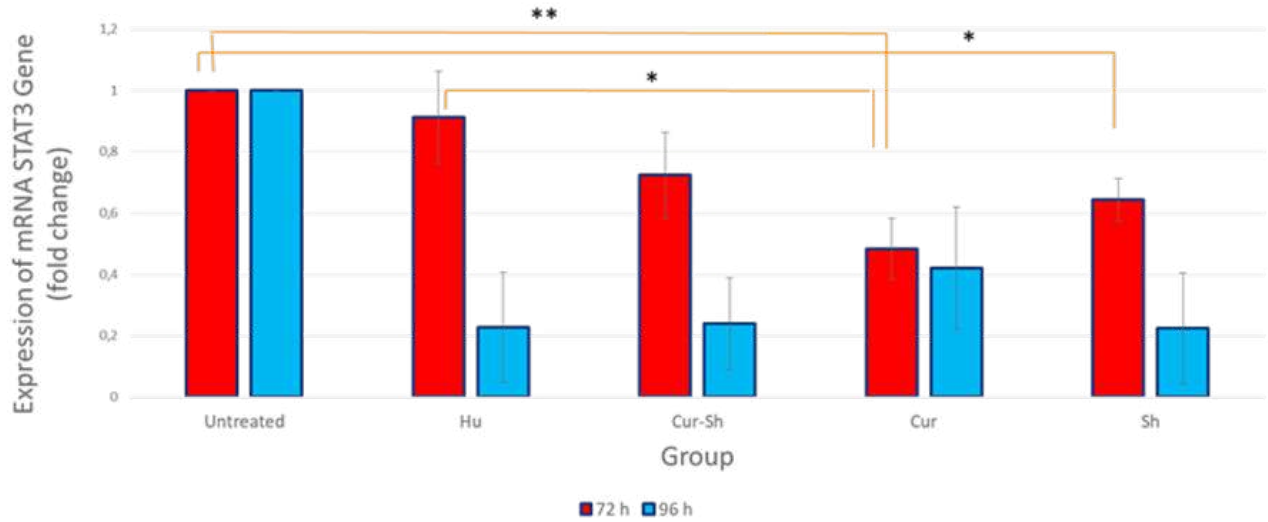

Figure 1: Differences in fold changes of STAT3 mRNA between groups after incubation of Curcumin (Cur), 6-Shogaol (Sh) and Hydroxyurea (Hu) on serial K562 cells for 72 and 96 h. Curcumin showed the strongest expression followed by 6-Shogaol compared with the control group without treatment (* p <0.05, ** p <0.01).

The results showed a decrease in STAT3 mRNA expression in all treatment groups in both the 72-h and 96-h time series compared to the untreated group. In the 72-h time series, the results are significantly different p <0.05. Then followed by post hoc LSD test, in the Curcumin treatment group, the lowest expression of STAT3 mRNA gene was 0.48 ± 0.1 (p = 0.008) which was significant compared to the control group without treatment. Next, in the 6-Shogaol treatment group, the expression of STAT3 mRNA gene (0.64 ± 0.07, p = 0.045) was significant compared to the control group without treatment. In the combination group of Curcumin with 6-shogaol, the expression of STAT3 mRNA gene (0.72 ± 0.14) was lower than the positive control group but higher than the curcumin and 6-shogaol group. In the 96-h time series, the results did not have significantly different (p = 0.098) between the treatment group and the control group without treatment. So, in the 96-h time series, there was a decrease in STAT3 mRNA expression, which was not significantly different.

The effect of Curcumin and 6- shogaol on haemoglobin F levels measured by the ELISA method can be seen from Figure 2. The results show that in a 96-h time series, Hb F levels were the highest in the curcumin group (1.6 ± 0.15; p = 0.015), then followed by the 6-shogaol group (1.11 ± 0.29). In the positive control group hydroxyurea and the combination of Curcumin + 6-shogaol, Hb F levels were consecutively (0.85 ± 0.16), (0.41 ± 0.01) lower than those in the untreated control group. The combination group of Curcumin with 6-shogaol was the group with the lowest Hb F level compared with the treatment group and the control group without treatment (p <0.05). In the 72-h time series, the Hb F level of all treatment groups was lower than the control group without treatment. Based on the one way ANOVA test, the 72-h treatment did not differ significantly (p> 0.05), but in the 96-h treatment, there was a significant difference (p <0.05). So, in the 96-h time series, the highest Hb F level occurred in the curcumin group, and the lowest Hb F level occurred in the combination group of Curcumin with 6-shogaol.

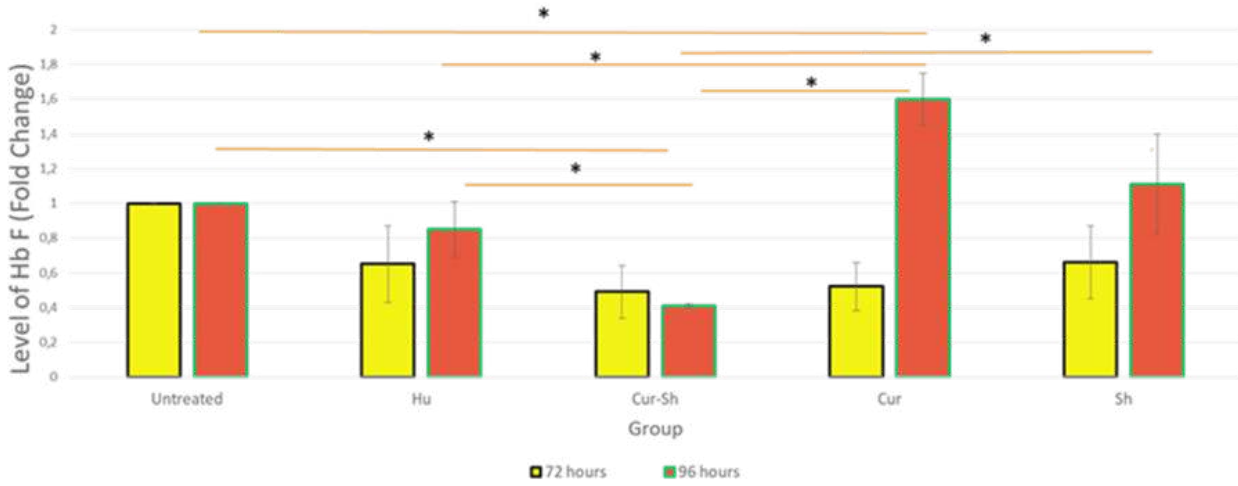

Figure 2: Differences in fold changes of HbF levels between groups after incubation of Curcumin (Cur), 6-Shogaol (Sh) and Hydroxyurea (Hu) on 72 and 96 h serial K562 cells. In the 96-h time series, Curcumin showed the highest effect on changes in HbF levels followed by 6-Shogaol compared to the control group without treatment (* p <0.0).

Reduced hexahydro-bisdemethoxy curcumin (HHBDMC) reduced curcuminoids were most effective in inducing gamma-globin mRNA (3.6 ± 0.4 fold) and Hb F (2.0 ± 0.4 fold) in erythroid primary precursor cells for seven days[8]. Curcumin works to reduce the expression of STAT3 genes so, the decrease in STAT3 gene expression will increase the production of Hb F. The role of 6-shogaol in Hb F induction through the activation of the p-p38 MAPK signal[9] whereas p38 MAPK is reduced by two weeks of curcumin activation[10].

Discussion and Conclusion

In beta-thalassemia patients there is an imbalance in the number of globin-α/globin-β chains, due to the lack or absence of globin-β synthesis, resulting in precipitation of free globin-α chains in erythroid precursors which results in the maturation and damage of erythrocyte cells, causing prolonged anaemia [11]. Therefore the best choice for the treatment of thalassemia patients is reactivation/ induction of globin-ϒ, so that replaces globin-β to join globin-α to form fetal haemoglobin and ultimately there is no excess free globin-α chains [12]. Individuals with elevated Hb F levels (> 8.6%) show a reduction in symptoms and increase patient life expectancy; hence, the induction of Hb F has the potential as a therapy in beta-thalassemia patients. Of the current therapeutic options, Hb F induction through pharmacological agents is the most feasible therapeutic choice [8].

Other transcription factors that play a role in the production of haemoglobin F are the phosphorylated STAT3 protein. Therefore, it is necessary to have a potential inhibitor to STAT3 in the framework of gamma-globin induction. Pharmacological inhibitors targeting STAT3 can be done in 5 ways, namely inhibition of STAT3 DNA-binding domain, abrogation of the STAT3 N-terminal domain, suppression of the STAT3 SH2 domain, inhibition of the STAT3-importin interaction, and/or blockage of upstream kinase activity [13].

The active compounds of the following herb, Curcumin, have broad molecular targets related to various molecular and biochemical cascades interacting directly on the target protein and epigenetic modulation of the target genes. Curcumin, as an epigenetic agent, functionally in modulating multiple biological processes, occurs at low concentrations. Curcumin plays a role in the expression of genes through direct interaction with transcription factors such as nuclear factor kappa-light-chain-enhancer of activated B cells (NF-kB), epigenetic modulation through inhibition of DNA methyltransferase I (DNMT1), histone acetyltransferase (HAT), histone deacetylase complex (HDAC) [14]. Various molecular targets of Curcumin include inflammation, kinase activity (MAPK, PKA,

JAK), transcription factors (CREB, STAT3, PPARϒ), enzyme activity (COX- 2, INOS, MMP), and others (VEGF, adiponectin, ROS) [15-16]. The 6-Shogaol are other active compounds of herbal ingredients that have molecular targets related to the regulation of Hemoglobin F. The 6-shogaol suppresses the expression of the products governed by STAT3. It was also reported that 6-shogaol caused the activation of JNK, p38 and ERK, as well as downregulating the expression of p38 MAPK, NF-κB and COX-2 [17]. Therefore, 6-shogaol can play a role in the induction of Hemoglobin F.

Hydroxyurea (100 μM) has a link between the regulator of globin-ϒ expression (MYB, BCL11A and KLF-1) with specific miRNA, and reveals the mechanism of Hb F production through inhibition of HU-induced miRNA [18]. Treatment with HU combined with HDAC2 knockdown increases gamma-globin expression. It was also reported that CD34 + cells treated with HU and MS-275 (HDAC inhibitors 1,2 and 3) had a relative induction of gamma-globin expression [19].

Curcumin is a decreasing expression of STAT3 mRNA gene and increases Hb F levels compared to 6-shogaol on K562 cells. While the combination of the two substances was not significant either in inhibiting STAT3 expression or HbF levels. The results of this study could be the basis for further research in vivo to reveal the signalling pathway in Hb F induction therapy ($\alpha_2\Upsilon_2$).

Conflict of Interest: Authors report no conflict of interest.

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Ethical Clearance: This study was approved by Medical and Health Research Ethics Committee (MHREC) Faculty of Medicine, Gadjah MadaUniversity-DR.Sardjito General Hospital (Ref: KE/FK/1150/EC/2017).

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Introduction of Probiotic Type of Yogurt for the Treatment of Dysbiosis of Patients with Lymphogranulomatosis Under Polychemotherapy by BEACOPP-II Protocol

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Abstract

The efficacy of using probiotic preparations of the yogurt type was studied in 136 patients with lymphogranulomatosis, suffering from intestinal dysbiosis while taking antibiotic therapy and polychemotherapy (BEACOPP-II protocol). It was found that probiotics of this type are highly effective for the treatment of dysbiotic disorders of the intestines in cancer and hematological patients. Their use significantly reduces the risk of complications such as an unpleasant aftertaste in the mouth, belching, heartburn, diarrhea, constipation, flatulence, discomfort or periodic abdominal pain. It is recommended that prolonged therapy with a probiotic of the yogurt type be used in these groups of patients.

Keywords: *Probiotic, dysbiosis, eubiosis, dyspepsia, lymphogranulomatosis, polychemotherapy.*

Introduction

Every year, the problem of dysbiotic conditions of the gastrointestinal tract is increasing among the world's population in general and among Russian citizens in particular [1]. Along with other reasons, the use of antibacterial drugs is one of the main causes of intestinal dysbiosis. Currently, observed dysbiosis is mainly of natural microbial origin. This is due to a violation of homeostasis of the natural microflora of the gastrointestinal system, leading to the occurrence of intestinal dysbiosis (dysbiosis). The prevalence of this clinical condition among all age groups in the human population exceeds more than 90% and is constantly increasing[2]. This negatively affects the clinical course, diagnosis and treatment of various nosologies, leading to the aggravation of various diseases and their pathomorphism [3,4].

Nowadays, lymphogranulomatosis has become one of the few highly liable diseases in the hematological practice. According to the German Hodgkin Study Group, achieving complete remission in patients with advanced stages is possible in 70-90% of cases, using effective polychemotherapy regimens in combination with or without radiation therapy [5]. Thus, polychemotherapy regimes in lymphogranulomatosis is very important and such regime usually given with antibacterial therapy leads to dysbiosis. Traditionally, the correction of dysbiotic conditions is achieved by introducing microbial associations of a healthy person in the form of probiotics into the patient's digestive system [6]. But most modern drugs all over the world are created on the basis of a limited number of bacterial strains, which are often poorly effective [7,8]. Probiotics such as yogurt are especially recommended when conducting antibacterial therapy, taking cytostatics, as well as for correcting the

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microflora of the digestive system in people with lactase deficiency. Due to the simplicity of their administration and relatively high bioavailability. Probiotics of the yogurt type are widely used in the complex therapy of various pathological conditions, including diseases of the gastrointestinal tract, oncological diseases with long courses of chemotherapy, which are characterized by inhibition of normal microflora with the development of dysbiosis syndrome.[9,10,11]

Purpose of the Study: To analyse the effectiveness of probiotic therapy in patients with dysbiosis initiated by polychemotherapy and antibiotic therapy in conditions of cancer alertness. Also to determine the effectiveness of yogurt-type probiotic preparations in patients with the above conditions.

Materials and Method

The study was conducted according to the results of treatment of 136 patients with lymphogranulomatosis, suffering from intestinal dysbiosis with the background of chemotherapy (BEACOPP-II protocol) and concomitant antibacterial therapy. The study involved patients with excluded organic pathology of the digestive system such as scars, erosion, hernia of the esophagus, gastritis, peptic ulcer of the stomach and duodenum, ulcerative colitis, Crohn's disease, primary tumors of the gastrointestinal tract; diseases leading to excretory insufficiency of the liver and pancreas. Patients underwent a course of polychemotherapy in the Department of Hematology and Chemotherapy of the State Budgetary Healthcare Institution of the Republic of Crimea "Crimean Republican Oncological Clinical Dispensary named after V.M. Efetov" in Simferopol, from April 2015 to March 2017.

The preparation used in the study contained: a lyophilized microbial composition of live strains of lactobacilli (Lactobacillus rhamnosus and Lactobacillus murinus), which differ from other lactobacilli by more pronounced (40–45%) viability in the presence of antibiotics and have higher activity (35–40%) suppression of pathogenic and conditionally pathogenic microflora.

Statistical processing of the results was carried out using the Microsoft Office Excel 2013 program, with the calculation of the t-criterion by the Student method for relative values, the data were considered reliable at t = 2, the reliability was Pt = 95.5%, and the risk of error was $p < 0.05$.

In our study involving all human participants were in accordance with ethical standards of the responsible committee on human experimentation and with the Helsinki Declaration of 1964 and later amendments.

Research Results: 136 patients with lymphogranulomatosis (Hodgkin's lymphoma) were examined, who received a course of polychemotherapy and suffered from intestinal dysbiosis that developed while taking antibacterial therapy.

An initial examination of patients revealed that in 47 (34.56%) patients, dysbiosis of the II degree was observed, and in 89 (65.44%) patients there was dysbiosis of the first degree. In 31 (22.79%) patients, dyspepsia/unstable stool type was observed and dyspepsia/constipation was observed in 18 (13.24%) of the examined patients. Flatulence was observed in 32 (23.53%) patients before probiotic therapy. 55 (40.44%) patients complained of discomfort and abdominal pain. Only the most pronounced subjectively and clinically significant syndrome complexes were taken into account.

The results of a retrospective analysis and dynamic examination of 136 patients before and after treatment of intestinal dysbiosis with and without antibiotic, radiation and polychemotherapy was observed (Table 1).

After 2 months of treatment with a probiotic type of yogurt in the study group, it was recorded that; II degree dysbiosis was not detected in the observed patients, but I degree dysbiosis was detected in 42 (30.88%) patients. Unstable stool, diarrhea after 2 months of treatment was determined in 3 (2.21%) patients. Constipation after treatment was observed in 2 (1.47%) patients. Flatulence was detected in 6 (4.41%) patients. Discomfort, abdominal pain were observed in 8 (5.9%) examined patients after the course of the treatment. In 23 (16.91%) patients it was observed that, after 2 months of treatment with a probiotic-type of yogurt, grade I dysbiosis was determined bacteriologically, despite the absence of any clinical symptoms and complaints of the digestive system from patients. In 94 (69.1%) patients, intestinal eubiosis was clinically and bacteriologically determined. The significance of differences for all of the above groups is t = 2, *Pt = 95.5%* and $p < 0.05$.

Table 1: The clinical condition of patients with intestinal dysbiosis before and after probiotic therapy.

Study Period	Prevailing of Clinical Syndromes (Number of Patients)			
	Unstable Stool, Diarrhea	Constipation	Flatulence	Discomfort, Abdominal Pain
Before treatment	31	18	32	55
After treatment	3	2	6	8

In the control group, after two months, no statistically significant changes were recorded. The observed patients still noted various disorders of the digestive system, such as belching, heartburn, diarrhea, constipation, flatulence, discomfort or periodic pain in the abdomen.

Conclusion

Probiotics such as yogurt demonstrate high efficiency in the correction of intestinal dysbiosis in oncological and hematological patients on the background of polychemotherapy and concomitant antibacterial therapy.

It has been proven that taking probiotics such as yogurt significantly reduces the incidence of dyspeptic disorders such as an unpleasant aftertaste in the mouth, belching, heartburn, diarrhea, constipation, flatulence, or periodical abdominal pain in patients suffering from dysbacteriosis, which has developed with the use of antibiotics.

Long-term therapy with a drug probiotic such as yogurt, which lasts more than 2 months, makes it possible to correct conditions such as grade I and grade II dysbiosis, contributing to intestinal eubiosis in a significant part of the observed patients.

Conflict of Interests: None declared.

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Ethical Clearance: In our study involving all human participants were in accordance with ethical standards of the responsible committee on human experimentation and with the Helsinki Declaration of 1964 and later amendments.

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Influence of Mental Health and Social Relationships on Quality of Life among Myanmar Migrant Workers in the South of Thailand

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Abstract

Background: Previous studies indicated that mental health and social relationships have influence on quality of life. However, there are limited studies on the association between mental health and social relationships on quality of life among Myanmar migrant workers in Thailand.

Method: This study aimed to determine the prevalence of quality of life and the influence of mental health and social relationships on quality of life among Myanmar migrant workers in the South of Thailand. This cross-sectional analytical study was conducted among 794 Myanmar migrants who were selected by using a multi-stage random sampling from 2 provinces in the South of Thailand to respond to a structured questionnaire interview. The generalized linear mixed model analysis was performed to determine the association between mental health and social relationships on quality of life when controlling other covariates.

Results: The prevalence of good quality of life among Myanmar migrant workers was 11.46% (95% CI:9.24-13.68). Mental health and social relationships were significantly associated with good quality of life were; no had depressive symptoms (adj. OR=3.83; 95% CI: 2.28-6.43, p-value < 0.001), had good relationship with employers (adj. OR=3.02; 95% CI: 1.71-5.31, p-value < 0.001) and had high level of involvement with peers (adj. OR=1.90; 95% CI: 1.09-3.32, p-value < 0.023). Significant covariates were average personal monthly incomes and received health information. About one-tenth of Myanmar migrant workers had a good quality of life. Mental health, social relationships and access to health information had influenced their quality of life.

Keywords: *Myanmar migrant workers, Quality of life, Social relationships, Thailand.*

Introduction

Quality of life (QOL) is a multidimensional level of an individual life's happiness where they live in societies to achieve their goal in life. QOL consists of 4 domains including physical, psychological, social relationships, and environmental domains[(1)]. The concept of QOL is commonly used to describe the well-being among various susceptible populations, such as migrants, refugees, etc.[(2-4)], since QOL describes the degree to which a person enjoys the important possibilities of his or her life[(5)].There were a number of factors influencing QOL. Social relationships were one of the factors associated with QOL of which it increased the likelihood of survival[(6)]. A study carried out in the Basque Country, Spain suggested that low social support was related to poor HRQOL, of which identifying the social support is a key in understanding health inequalities among immigrants[(7)].

Migrating to a new country is an extremely complex and stressful process because it involves changes in all areas of life-socially, culturally and psychologically[(8)]. Psychosocial factors such as lack of social and emotional support from relatives and friends[(9)] were common among migrant workers. Some studies indicated that migrant workers were refused by local citizens[(10)] and lack of legal migration status in migration processes[(11)].

Depression, one of the most common mental health disorders, was identified as having a positive relationship with occupation injury[12]. Depression imposes an immense social burden which leads to functional impairment, decreased quality of life, low productivity and impaired interpersonal relationship[13].

Thailand economic growth has attracted an increasing number of migrant workers from neighboring countries[14]. Migrant workers in Thailand are mostly involved in the ''3 Ds'' jobs (dangerous, dirty and degrading jobs). These 3Ds conditions push them at risk for health problems. One notable health hazard of migrant workers is the deterioration of mental health, which has been implicated to suicide that is more common among migrant workers than that of local citizens [15].The Office of Foreign Worker Administration of Thailand reported that in July 2019 there were 2.83 million migrants residing in Thailand, and about 1.87 million were from Myanmar. About 358,530 Myanmar migrant workers were in the South region. Most of these migrants worked in the manufacturing sectors, agriculture and animal husbandry,fishery, and construction. Therefore, this study aimed to determine the prevalence of quality of life and the influences of mental health and social relationships factors on quality of life among Myanmar migrant workers in the South of Thailand.

Materials and Method

Study design and sampling: This cross-sectional analytical study was conducted in 2018. The populations were Myanmar migrant workers in the South of Thailand. The sample size was calculated by using the formula to estimate the sample size for logistic regression analysis of Hsieh [16]. The estimated sample size was 794. We recruited Myanmar migrant workers from 2 southern provinces by using multi-stage random sampling method.

Questionnaire: A structure questionnaire was developed based on the research questions and relevant literatures. The structured questionnaire consisted of 6 parts: A) Demographic and socioeconomic characteristics, B) Social relationships, C) Health behaviors and physical health status, D) the Perceived Stress Scale (PSS) of Cohen et al.[17], E) The Center for Epidemiology Studies Depression Scale (CES-D)[18], and F) WHOQOL-BREF was used to assess the quality of life. QOL scores were categorized into three groups: a)poor level (26-60scores), b) moderate level (61-95scores), c) good level (≥96scores)[1]. The questionnaire was undergone content validation by 5 experts and revised to improve its validity. The Cronbach's alpha coefficient of PSS, CES-D, and WHOQOL-BREF were 0.78, 0.70, and 0.85 respectively.

Statistic Analysis: All analyses were performed using Stata version 10.0 (StataCorp, College Station, TX). Demographic and socioeconomic characteristics of the participants were described by using frequency and percentage for categorical data as well as the mean and standard deviation for continuous data. A simple logistic regression was used for bivariate analysis to identify individual factor associated with QOL. In the bivariate and multivariable analysis, quality of life was classified into 2 groups using the cutoff score of ≥ 95 points which mean 'hada good quality of life'. The independent factors that had p-value <0.25[19]were processed to the generalized linear mixed model (GLMM) analysis to identify the association between mental health and social relationships with QOL when controlling the effect of other covariates and reported the adjusted odds ratio (Adj. OR),95% confidence interval (CI) and p-value<0.05 as the magnitude of effect and statistical significant level.

Results

Majority of the Myanmar migrant workers were male (58.31%) with the average age of 32.79 (±9.00) years old, 69.52% were married and 37.78% finished only primary education. Most of them lived in urban settings (81.74%), 75.19% lived with a family and 46.98% lived in a labor camp. The highest proportion worked in manufacturing (29.97%) followed by agriculture and animal husbandry, fishery and construction. Their average personal monthly incomes was 9,201.17 (±2,681.29) Baht, of which 3,203.21 (±1,660.17) Baht were average personal monthly expenditures. Almost all had health insurance (99.62%).

Most of the workers worked both indoor and outdoor (64.23%) and the rest (35.77%) worked only indoor. Most of them satisfied with their living and working conditions as well as the relationship with others, except that 58.56% had a limitation on traveling. About one-third were smokers(38.16%), 16.12% were drinkers. More than half of the migrant workers (54.91%) had a physical check-up and 11.08% had chronic diseases. Most of them (88.66%) had a moderate level of stress and more than half (52.77%) had depressive symptoms.

Concerning the quality of life, 85.77% (95% CI: 83.15-88.03) of the migrant workers had a moderate level, 11.46% (95% CI: 9.42-13.87) had a good level and 2.77% (95% CI:1.82-4.17) had a poor level.

Factor associated with good quality of life:

Bivariate Analysis: The bivariate analysis results indicated that the independent variables that possibly associated with good QOL (p-value<0.25) were;average personal monthly income, physical health check-up, involvement with peers, relationship with employers, relationship with co-workers, relationship with family, received health information and depressive symptoms. These factors have proceeded to the multivariable analysis (Table 1).

Table 1: Factors associated with good quality of life: Bivariate analysis

Factors	Number	% Good QOL	Crude OR	95% CI	P-value
Depressive symptoms					<0.001
Yes	419	6.21	1		
No	375	17.33	3.16	1.96-5.11	
Gender					0.261
Female	331	9.97	1		
Male	463	12.53	1.29	0.82-2.03	
Age (Years)					0.270
< 30	427	10.30	1		
≥30	367	12.81	1.27	0.82-1.97	
Education					0.293
Primary school or lower	346	10.12	1		
Secondary school or higher	448	12.50	1.12	0.82-1.40	
Average personal monthly incomes (Baht)					0.032
<9,300	484	9.50	1		
≥9,300	310	14.52	1.61	1.04-2.50	
Average personal monthly expenditures (Baht)					
<3,000	327	11.31	1		0.913
≥3,000	467	11.56	1.02	0.65-1.59	
Physical health check-up					0.012
No	358	8.38	1		
Yes	436	13.66	1.77	1.12-2.82	
Involvement with peers					<0.001
Low to moderate	465	7.53	1		
High	329	17.02	1.90	1.60-3.94	
Relationship with co-workers					<0.001
Poor to average	445	7.87	1		
Good	349	16.05	2.23	1.43-3.50	
Relationship with family					0.001
Poor to average	229	6.11	1		
Good	565	13.63	2.42	1.34-4.37	
Relationship with employers					<0.001
Poor to average	474	6.12	1		
Good	320	19.38	3.68	2.31-5.88	
Chronic diseases					0.051
Yes	88	5.68	1		
No	706	12.18	2.30	0.90-5.83	

Factors	Number	% Good QOL	Crude OR	95% CI	P-value
Received health information					0.009
No	433	8.78	1		
Yes	361	14.68	1.78	1.14-2.78	

Factors associated with good quality of life: multivariable analysis: The generalized linear mixed model analysis (GLMM) by Backward elimination indicated that mental health and some social relationships were associated with good quality of life which were; had no depressive symptoms (adj. OR=3.83;95% CI:2.28-6.43, p-value < 0.001), hadgood relationship with employers (adj. OR=3.02;95% CI:1.71-5.31, p-value < 0.001) and had high level of involvement with peers (adj. OR=1.90; 95% CI: 1.09-3.32, p-value < 0.023). Other significant covariates were had average personal monthly incomes ≥9,300 Baht (adj. OR=1.62; 95% CI: 1.01-2.59, p-value = 0.043) and received health information (adj. OR=1.62;95% CI:1.00-2.61, p-value = 0.048)(Table 2).

Table 2: Factors associated with good quality of life: Multivariable analysis

Factors	Number	% Good QOL	Crude OR	Adjusted OR	95% CI	P-value
Depressive symptoms						<0.001
Yes	419	6.21	1	1		
No	375	17.33	3.16	3.83	2.28-6.43	
Relationship with employers						<0.001
Poor to average	474	6.12	1	1		
Good	320	19.38	3.68	3.02	1.71-5.31	
Involvement with peers						0.023
Low to moderate	465	7.53	1	1		
High	329	17.02	2.52	1.90	1.09-3.32	
Other covariates						
Average personalmonthly incomes (Baht)						0.043
<9,300	484	9.50	1	1		
≥9,300	310	14.52	1.61	1.62	1.01-2.59	
Received health information						0.048
No	433	8.78	1	1		
Yes	361	14.68	1.78	1.62	1.00-2.61	

Discussion

The findings observed that most of the Myanmar migrant workers perceived of having a moderate level of QOL (85.77%), only 11.46% having good QOL. It might be that the situations where they lived and worked were as they expected. They were not much better. This study also observed that those who had no depressive symptoms had a significantly better quality of life in comparison with those who had depressive symptoms, of which similar with previous studies conducted in China[20, 21].Besides, those who had a good relationship with employers had a significantly better quality of life in comparison with those who had a poor and average level which was similar with a study conducted in Thailand[22]. It might be that the relationship with peer could result in job security and incomes. The migrant workers who had a high level of peer involvement had significantly better QOL than those who had low to moderate levels of peer involvement which was similar to a study in Sweden[23]. It might be that they could share various issues and able to release their tensions. Concerning personal monthly incomes, this study indicated that those who had average personal monthly incomes ≥9,300 Baht were more likely to have good QOL in comparison with those who had lower incomes. A study conducted in China was also observed a similar finding[20]. Concerning health, migrant workers who received health information were more likely to have a better quality of life in comparison with those who had not received health information. Migrants have usually accessed health information

through social networks more than formal health service providers due to language and access barriers[24].

Conclusion

About one-tenth of Myanmar migrant workers in the South of Thailand had a good QOL. After adjusting for other covariates which were personal monthly income and access to health information;mental health especially depressive symptoms and social relationships including had a good relationship with employers, and high level of peer involvement were found significantly associated with QOL.

Conflict of Interest: The authors declare that no conflict of interest

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Lumbosacral MRI Findings in Chronic Lower Back Pain

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Abstract

Background: Low back pain (LBP) is one of the most common musculoskeletal disorders demanding hospital visits. Inter vertebral discdegeneration is a known cause of chronic low LBP back pain. The relation between changes in the lumbar spine and lower back pain is controversial.

Objectives: To assess LSS MRI findings in patients with CLBP, and to show the relation of disc degeneration with age and gender.

Material and Method: 218 adult patients with chronic lower back pain (pain more than 12 weeks) did Lumbosacral spine MRI, at Azadi Teaching Hospital/Kirkuk city, from March/2017 to April/2018, those with a positive history of spinal pathology other than osteoarthritis were excluded. The disc degenerative MRI changes at each lumbar disc were assessed and correlated according to age and gender.

Results: 146 of patients were male, and 72 of them were female, their age ranged from (16-73 years). Males and elderly patients were affected by disc degeneration more. 92.2% of patients had disc degeneration, followed by disccontour abnormality, facet joint arthrosis, high-intensity zone (HIZ), spinal canal stenosis, Modicchanges (MC), Schmorl's nodes (SN), and spondylolesthesis. L4-L5 disc was the most commonly involved level by disc degeneration, followed by L5-S1disc, the least level was L1-L2.

Conclusions: Most patients with CLBP have DDD. Older males are the most susceptible people to develop DDD which affect most commonly L4-L5 disc level, other findings may associate with DDD are MC, SN, HIZ, facet joint arthrosis, spinal stenosis, and spondylolesthesis.

Keywords: *Chronic, lumbosacral, lower back pain, MRI.*

Introduction

Low back pain (LBP) is one of the most common musculoskeletal problems demanding hospital visits, and the main contributing cause of disability in adults. LBP occurs in most of the people during any period of life.[1,2,3,4,5] Although several causes have been implicated in low back pain, disc degeneration disease (DDD) is a known cause of this pain.[6,7]. Chronic pain is defined as pain for more than 12 weeks.[8]

DDD of the lumbosacral spine (LSS) in adults can start in the third decade of life.[6] There are several risk factors related to disc degeneration in the LSS, including age, increased physical loading, obesity, and genetic influences.[4,9,10]

Magnetic resonance imaging (MRI) is often requested and of choice in the management of patients with LBP as different abnormalities can be seen on spinal MRI.[11,12,13] LSS MRI findings of DDD include decreased disc space, decreased signal intensity on T2W images which indicates disc dehydration. Disc degeneration on T2-weighted sagittal magnetic

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resonance images of the lumbar spine is appeared and graded as:

Grade (0): Normal No signal changes; Grade (1): the signal intensity of the nucleus pulposus is slightly decreased; Grade (2): seen as hypointense nucleus pulposus with preserved disc height; Grade (3): seen as hypointense nucleus pulposus with narrowing of disc space. [14]

Disc degeneration may be associated with disc bulging/herniation, and high-intensity zone(HIZ). [9, 15] Herniated disk is defined as a "focal displacement of nucleus, cartilage, a piece of annulartissue or fragmented apophyseal bone beyond the space of the intervertebral disc.Disc displacement most commonly is classified into fivegrades (normal, disc bulge, protrusion, extrusion, and sequestration). [16, 17](HIZ) represents tear in the annulus fibrosus of the disc, seen as very bright signal intensity on T2 weighted images at the posterior part of the disc. [18]Other findings which associated with DDD include Modic changes (MC), Schmorl's Nodes (SN), facetjoint degeneration, spondylolesthesis, and spinal stenosis. [19]

This study was done to assess LSS MRI findings in patients with CLBP, and to showthe relation of DDD with age and gender.

Patients and Method

Subjects: Inclusion criteria: Two hundred eighteen (218) adult patients with chronic lower back pain (more than 12 weeks) were sent to MRI department at Azadi teaching hospital/Kirkuk city/Iraq, as a part of the management of lower back pain, over the period from March/2017 to April/2018. Their ages range from 16 to73 years.

Exclusion criteria: Those who had a history of spinal surgery or back trauma, known spinal pathology, malignant diseases,and athletes were excluded from the study. Clinical information was obtained from the documentation of physicians.

Imaging: All lumbosacral spine MRI examinations were done using the 1.5-T unit (Philips Acheiva,

Netherland 2010) with a dedicated lumber coil, imaging protocol was as follows:

1. T1-weighted sagittal Turbo spin echo (TSE) with 8 msec echo time (TE) and 500 msec repetition time(TR).
2. T2- weighted sagittal TSE with 100 msec TE and 4000 TR.
3. T2-weighted axial TSE with 120 msec TE and 4000 TR, and
4. Myelography with 1000 msec TE and 8000 TR.

The images were interpreted by two board-certified radiologists with 7 years experience, any difference in opinion were settled by consensus. Each lumber level of 218 patients was assessed for disc degeneration scoring, disc bulging and herniation, HIZ,presence of MC, SN, facet joint degeneration, spondylolesthesis, and spinal stenosis.

Statistical analysis: It was a cross-sectional analytic study. The study population demographic criteria including age in years, weight in kilograms (kg), and height in centimeters (cm)were expressed as means(SD). Percentage of Disc degeneration at different lumber disc levels was assessed and related to gender and age, total degeneration score was estimated for each patient as average degeneration score of all lumbar disc levels and related to age, using Chi-square test. *P*-value level of less than 0.05 was required for significance. Percentage of disc bulge/herniation, HIZ, MC, SN, sponylolisthese, facet joint arthropathy, and spinal stenosis were also estimated. SPSS software, version 17, was used for the statistical analyses.

Results

The demographic criteria of the study sample were as seen in table 1.

Table 1: The demographic criteria of the study sample

Category	Male ([a]N = 146) Mean (SD)	Female (N=72) Mean (SD)	t-value	P value
Age (Years)	43.5 (12.1)	42.5 (12.7)	0.5645	0.5730
Height (cm)	174.3 ± 6	161.3 ± 5.8	15.3747	0.0001
Weight (kg)	83.31 ± 14	74 ± 8	5.2332	0.0001

[a]Number.

There were 146 males and 72 females in the study sample; male to female ratio was 2:1, 141 males (96.6%) and 60 (83.4%) of females had disc degenerative changes in their LSS MRI.

Males were significantly more affected than females by disc degeneration (*P*=0.0006).

Most of the patients had abnormal MRI findings 201 (92.2%), and only 17 (7.8%) had a normal MRI study. 32 patients were less than 35 years old, 140 patients were 36-55 years old, and 46 patients were more than 55 years old. 68.8% of < 35 years old group,95% of 35-55 years old group, and All patients >55 years old group had disc degeneration change. The incidence of disc degeneration was significantly increased with advancing age (P<0.001) as seen in table 2.

Table 2: Relation of disc degeneration with age.

Age	Disc Degeneration		Total
	Male	Female	
< 35	17	5	22
35-55	98	35	133
>55	26	20	46

The total number of the affected disc was 588 levels of a total of 218 patients. The most commonly affect level was L4-L5 in 32%, followed by L5-S1, L2-L3, L3-L4, and L1-L2 in

21.2%, 19.1%, 18%, and 9.2% respectively as seen in figure 1.

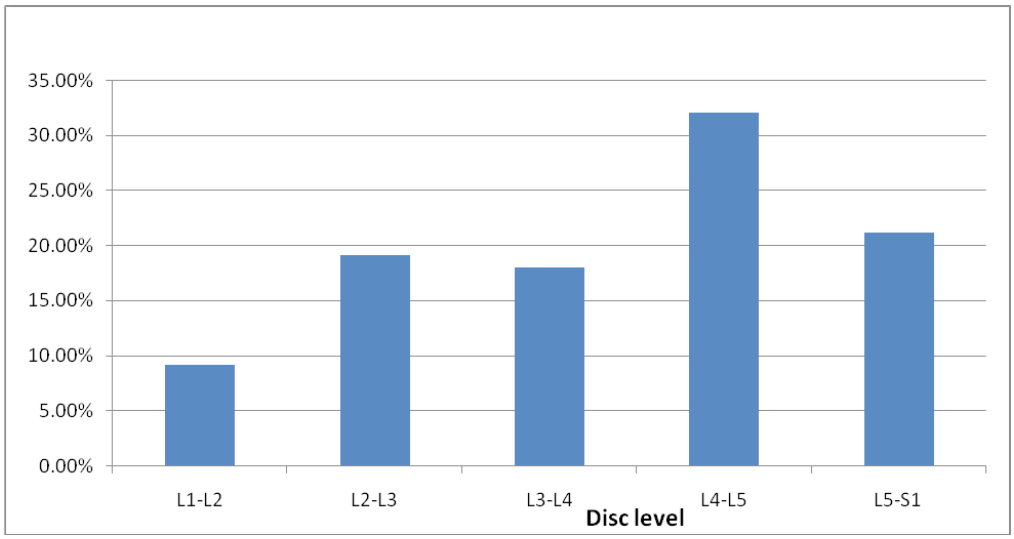

Figure 1: Distribution of disc degeneration according to disc level.

Disc degeneration was present at one level in 25%, and multilevel in 75%. The average disc degeneration score of each patient was score 0 in 7.8% (17 patients), score I in 30.1% (66 patients), score II in 37.2 (81 patients), and score III in 24.8% (54 patients) (Table 3).

Table 3: The relation between disc degeneration score and age.

Age (Years)	Total Degeneration Score				Total
	0	I	II	III	
>35	10	18	4	0	32
36-55	7	40	61	32	140
55<	0	8	16	22	46
Total	**17**	**66**	**81**	**54**	**218**

Score 3 disc degeneration was not seen in <35 year's age group, and all patients who were <55 years old group had degeneration with different scores, the score of degeneration was significantly increased with increasing age (*P*> 0.001).

Other LSS MRI findings were as the following: disc contour abnormality (70.7%), HIZ (27.8%), SN in (12.9%), MC (19.3%),spinal stenosis (20.4%), facet joint degeneration (45.2%), and spondylolisthesis (6.4%).

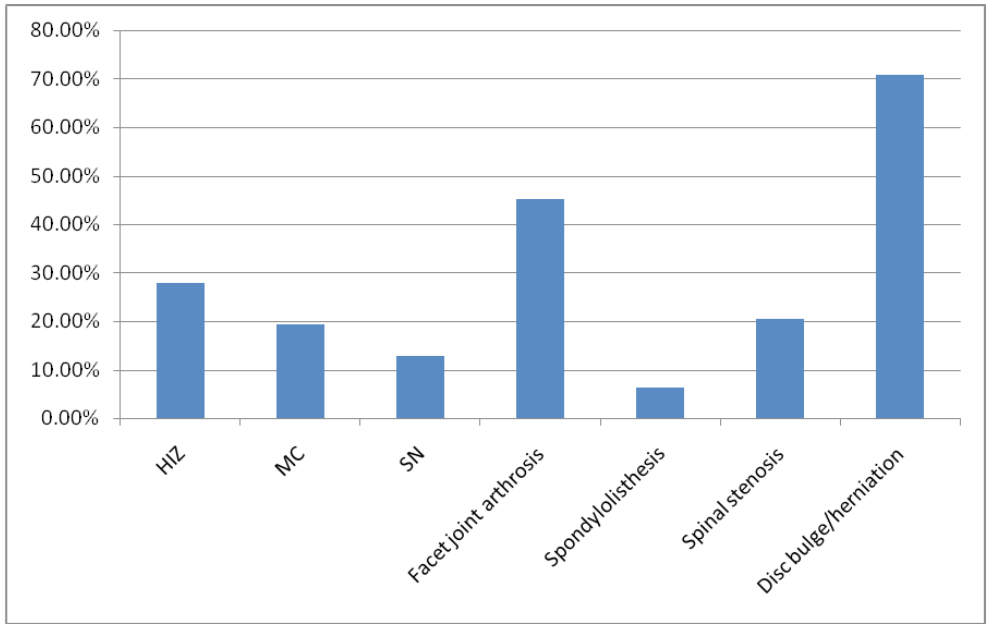

Figure 2: Percentage of MRI changes associated with disc degeneration.

Discussion

Degenerative changes were seen in the majority (92.2%) of patients with chronic lower back pain;most of these changes were observed at L4/L5 and L5/S1 levels and lowest rate of involvement was noted at L1-L2 level. Similar outcomes had been perceived in most of the previous studies,due to the highest mechanical strain at these levels[20, 21,22, and 23].

Multiple disc level involvement was common as compared to the single-disc involvement; which was also in line with past studies.[16, 24]In this study the incidence of disc degeneration significantly increased with age, due to aging process which involves decreased vascularization, and decreased delivery of nutrients and growth factors to the disc.[25] This result was similar to several studies.[20,26] The fewer percentage of DDD that's seen in younger age group also noticed in other studies like us, its exact etiology is not clearly known, but issues like genetic, autoimmune, and biochemical factors may play a role inthe pathogenesis of disc degeneration.[27]

Males were affected significantly more than females in our study which was comparable with other studies,[28,29] as men engage in jobs associated with heavy workload compared with women.[30]Mechanical load that contributes to DDD might also have a role in the pathogenesis of disc contour abnormalities, HIZ, MC, and SN.[31,23,33].

Conclusions

Most of patients with CLBP have DDD. Older males are the most susceptible people to develop DDD which affect most commonly L4-L5 disc level, other findings may associate with DDD including MC, SN, HIZ, facet joint arthrosis, spinal stenosis, and spondylolesthesis.

Conflict of Interest: None.

Source of Funding: None.

Ethical Approval: The permission was obtained from the Azadi Teaching Hospital Committee and informed consent was obtained from each individual before data collection was begun. Personal data was not explored.

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Joint Effect Obesity and Oral Contraceptive Use towards Hypertension among Women in Thirteen Provinces in Indonesia

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Abstract

Introduction: Hypertension complications cause 9,4 million people died in the whole world every year. Hypertension in a woman is more dangerous than man, as they affect mortality and morbidity not only at herself but also the fetus in a pregnant woman. Hypertension is stimulated by many risk factors, some of them were obesity and using oral contraception. The purpose of this study is to evaluate obesity, oral contraceptives use and their joint effect on the risk of hypertension among women in Indonesia.

Method: A cross-sectional study from Indonesian Life Family Survey 5 data, including 10.270 women with age ≥18 years old lives in Indonesia. Weight, Height and Blood Pressure were measured. Hypertensive respondents if the blood pressure ≥140/90 mmHg, while obese defined by body mass index ≥27,5 kg/m^2. History of contraceptive used, smoking behavior and age were investigated. The effect between the independent and dependent variables in this study can be determined by Prevalence Ratio (PR) and estimated under Cox Regression Model.

Results: Our study showed that obesity, oral contraceptive used, and age significantly become risk factor of hypertension with PR (95% CI) respectively 2,12 (1,94 – 2,31); 1,21 (1,10 – 1,33); and 2,65 (2,42 – 2,91). Combination OC users and obesity significantly elevated the risk of hypertension by PR 2,149 (1,90 – 2,42) among women in Indonesia. Compared with OC, Obesity was more strongly associated with hypertension with PR 1,93 (1,74-2,13).

Conclusions: Obesity, OC users and their joint effects significantly increased the risk of hypertension among women in thirteen Provinces in Indonesia. The way better to prevent being obese than preventing using OC in the case of hypertension.

Keywords: *Hypertension; Obesity; Oral Contraceptive.*

Introduction

Hypertension complications cause 9,4 million people died in the whole world every year.[26] Hypertension in a woman is more dangerous than man, as they affect mortality and morbidity not only at herself but also the fetus in a pregnant woman.[7] Hypertension prevalence in people aged ≥ 18 years in Indonesia continues to increase from 2013 to 2018. Based on the basic health research 2013 and 2018, the prevalence of hypertension in Indonesia is 25.8% and 34.1% respectively.[9,10] The proportion of hypertension in 2018 was 31.34% in men and 36.85% in women.[10]

Hypertension induced by obesity cause of adipocytes in obese people induced increase in renin-angiotensin system which increasing sodium absorption, fluid volume, and also activate sympathetic nervous system. Those adipocytes also induced inflammation and reduced insulin sensitivity which attends to become endothelial dysfunction and arterial stiffness or vasoconstriction which leads to hypertension.[12] Obesity has been defined by the World Health Organization (2000) and The National Heart, Lung and Blood Institute (1988) as a body mass index (BMI) ≥ 30 kg/m^2.[2] This classification not appropriate to describe the association of various diseases due to obesity in Asia, because the percentage of

subcutaneous fat in Asians is more than the Caucasian at the same age, sex and BMI.[2,21,23] In 2004, WHO Expert Consultants suggested the classification of the latest BMI in terms of the risk of cardiovascular disease where the risk cut or point of obesity in the Asian population is ≥27.5 kg/m^2.[23] The prevalence of hypertension in the overweight and obese group is 40.8% while the prevalence of hypertension in the group with normal and thin BMI is 25.3%.[14]

Using oral contraceptives or pills containing estrogen and progesterone causes cardiac hypertrophy and increases the presenting response of angiotensin by involving the renin angiotensin system which causes high blood pressure.[3,15,16] The prevalence of hypertensive patients increased in line with the long duration of oral contraceptive use. It is known that the prevalence of hypertension in women who do not use oral contraceptives, use less than 1 year, less than 2 years and more than 2 years in a row were 14.3%; 13.9%; 21.3%; 22.8%.[16] Oral contraceptives is the second contraceptives most chosen by women 15-49 years old in Indonesia after giving birth to the last child is 8,5%, and the first one is injection every 3 months is 42,4%.[10]

A study using the 2013 basic health research data explained that women of childbearing age (WUS) who had a body mass index of more than 25 kg/m^2 had 2.7 fold risk of developing hypertension.[11] A crossectional study states that those who are obese (> 25kg/m^2) have a risk of hypertension of 1,681 times compared to non-obese after being controlled by age variables, a history of family hypertension and physical activity.[18] Hypertensive women and those without hypertension (adjusted) were 1.96 for oral contraceptive use>2 years and 1.22 for use at>1 year.[16] Wang's research in 2011 showed the combined effect of obesity and the use of oral contraceptives at a risk of 8.02 times (OR 8.02, CI 5.05-12.74) greater than hypertension with an addictive interaction of P = 0.039.[21]

Method

This study using cross-sectional design from Indonesian Life Family Survey 5 (IFLS-5) data. IFLS-5 is the fifth survey was held in 13 of 27 provincein Indonesia in 2014. This survey used household survey from IFLSdata. The subjects of this study including 10.270 women 18-49 years old, live in Indonesia and have complete data for each variable would be analyzed in this study. Weight, Height and Blood Pressure were measured. Hypertensive respondents if the blood pressure ≥140/90 mmHg, diagnosed by health workers, or consuming hypertension pills. While obese defined by body mass index ≥27,5 kg/m^2 this cut off based on WHO Expert Consultant.[23] Oral contraceptive used, smoking behavior and age were investigated. Collecting, editing and analyzing data IFLS-5 using software STATA (v.12, StataCorp). The effect between the independent and dependent variables in this study can be determined by Prevalence Ratio (PR) with confidence intervals (CI) 95% and estimated using Cox Regression Model in constant time.

Results

Sociodemographic characteristic between hypertensive and non-hypertensive cases: Majority women with any kind of characteristic classified as not hypertension case. Our study showed that obesity, oral contraceptive used, and age significantly become risk factor of hypertension with PR (95% CI) respectively 2,12 (1,94 – 2,31); 1,21 (1,10 – 1,33); and 2,65 (2,42 – 2,91). This individual risk factors are shown in (**Table 1**).

Association obesity and the risk of hypertension: After adjustment for age, the obese women have 1,93 fold (PR 1,93, 95% CI 1,74-2,13) increased risk of hypertension compared with non-obese women. This effect less than PR before adjustment (PR 2,16, 95% CI 1,95–2,38) (**Table 2**).

Association oral contraceptive use and the risk of hypertension: After adjustment for age, the obese women have 1,22 fold (PR 1,22, 95% CI 1,07 – 1,38) increased risk of hypertension compared with non-obese women. This effect is the same with PR without adjustment (**Table 2**). There is association was observed between Obesity and OC users (p< 0,001) (data not shown).

Table 1: Analyses of Risk Factors for Hypertension in Women

Variable	Hypertension N (%)	Not Hypertension N (%)	RR	P-value	PAR (%)
Obesity					
Yes	899 (35,44)	1638 (64,56)	2,12 (1,94 – 2,31)	0,0001	35,97
No	1291 (16,69)	6442(83,31)	(Reff)		

Variable	Hypertension N (%)	Not Hypertension N (%)	RR	P-value	PAR (%)
Oral Contraception					
Yes	562 (24,75)	1709 (75,25)	1,21 (1,10 – 1,33)	0,0001	9,75
No	1628 (20,35)	6371 (79,65)	(Reff)		
Age					
34-49 years	1569 (31,34)	3438 (68,66)	2,65 (2,42 – 2,91)	0,0001	45,29
18-33 years	621 (11,80)	4642 (88,20)	(Reff)		
Smoking					
Yes	40 (25,48)	117 (74,52)	1,20 (0,87 – 1,64)	0,252	9,12
Ever	17 (26,98)	46 (73,02)	1,27 (0,78 – 2,04)	0,324	11,95
No	2133 (21,22)	7917 (78,78)	(Reff)		
Sleep Disturbance					
Yes	2007 (21,08)	7513 (78,92)	0,86 (0,74 – 1,00)	0,058	-
No	183 (24,40)	567 (75,60)	(Reff)		

Table 2: Obesity Combined with OC Use Associated with The Risk of Hypertension

Obesity	OC	Hypertension N (%)	Not Hypertension N (%)	Crude PR (95% CI)	P-value	*Adjusted PR (95% CI)	P-value
+	+	243 (38,27)	392 (61,73)	2,40 (2,08 – 2,76)	0,0001	2,11 (1,83 – 2,43)	0,0001
+	-	656 (34,49)	1246 (65,51)	2,16 (1,95 – 2,38)	0,0001	1,93 (1,74 – 2,13)	0,0001
-	+	319 (19,50)	1317 (80,50)	1,22 (1,07 – 1,38)	0,002	1,22 (1,07 – 1,38)	0,002
-	-	972 (15,94)	5125 (84,06)	(Reff)		(Reff)	

*Adjusted for Age

Joint Effect obesity and OC users on the risk of hypertension: As shown in **Table 2**, before adjustment combination obesity and OC users significantly elevated the risk of hypertension by compared to among women in Indonesia with PR 2,4 (2,08 – 2,76).OC users slightly elevated the risk of hypertension among both obese and non-obese women. The joint effects of Obesity and OC users significantly increase the risk of hypertension by 1,11 fold (PR 2,11, 95% CI 1,83 – 2,43).An antagonism biologic interaction between obesity and OC users was detected (p = 0,0174).

Discussion

From this cross-sectional study we evaluate that obesity, OC users and their joint effects on the risk of hypertension in women of 13 provinces in Indonesia. Our results indicated that Obesity and OC users were all risk factors for hypertension. We suggested a strong effect of obesity (BMI ≥ 27,5 kg/m^2) on hypertension risk, which attribute 35,97% in population. Same study in Chinese population showed effect of increased BMI on hypertension attributed 32,51% of PAR (Population at Risk) with BMI ≥ 24 kg/m^2 vs BMI <24 kg/m^2.[21] There are many studies emphasized whether biologic mechanism obesity induced hypertension,[5,12] also their association around the world. This also proved in the present study, we verified that obesity was the risk factor for hypertension significantly. Therefore, in the future the body mass index (BMI) such as obesity should never be underestimated.

OC use as hypertension risk have attributable risk not as much as obesity was 9,75%. OC used is well known could change blood pressure by few millimeters and 2-3 fold increase incidence of hypertension.[3,24] Both World Health Organization (WHO) and American College of Obstericians and Gynecologists (AJOG) have formally offered that Hypertension was one of contradiction to use COC but AJOG would allow COC use in women with well-controlled hypertension in some circumtances.[4] Low dose COC consist ethinyl estradiol dose less than 50 µg would increase risk of myocardial infraction and ischemic stroke approximately 2 fold

in the general population of COC users.[4,21,24] This cross-sectional study also confirmed OC as risk factor of hypertension significantly.

Interestingly we found there is joint effect between Obesity and OC use towards hypertension. Biologic Interaction identified by this study was antagonism although the risk of joint effect was bigger that independent risk of obesity or OC use. In the contrary,a case-control study in China also found joint effects general and central obesity, combined oral contraceptives (COC) use and hypertension, also shown a synergism interaction($p = 0,039$).[21] They found that the higher body mass index and the more longer respondent using COC therefore the risk of hypertension became a lot higher. The risk increased dramatically in combination of COC use with a BMI $\geq$ 28 kg/m^2 or Waist Circumference (WC) $\geq$ 90 cm with OR 8,02 (5,05 – 12,74) and OR 5,76 (3,65 – 9,12) respectively.[21]

This research found increasing risk to hypertension in joint effect obesity and OC use but have antagonism interaction. This might be caused by first, the operational definition of OC users had been used in this research was consist of women that using OC; women have used OC in her lifetime with proportion consecutively 11,20% and 10,92%.Women have used OC would have been stop for a long time ago or short time, a cohort study included 2112 hypertension people found that stopping OC in 6,6±7,5 months was an effective antihypertensive intervention in a clinical setting.[13] The study showed there is association between stopping OC and improved prognosis as reduction of at least 10 mmHg in Diastolic Blood Pressure (DBP) or 20 mmHg in Systolic Blood Pressure (SBP) with OR 0,27 (CI 95% 0,06 – 0,90) adjusted by age, weight and drug prescription.[13] Another study state that COC users would increase 5-6 mmHg of SBP and 1-2 mmHg in DBP.[3] Besides, the period of time women who have a history used OC did not provide by RAND cooperation therefore we did not have information about that. Also as the limitation of our study, we did not identify the period of time using OC.

Second, there are two types of oral contraceptives used in Indonesia which were mini pil (progestin only pill/POP) and pil KB (Combination Oral Contraceptive/ COC), but this study was blinding that because there are no information about that. Although whether POP or COC could increase blood pressure in experimental study in rats, which increasing blood pressures (systolic and diastolic) were higher in COC user that POP.[3]But,contraryin some study literature review and meta-analysis about POP and hypertension drawn conclusion no association POP and increasing blood pressure.[6,8]This two condition affect the risk of OC and their joint effect with obesity towards hypertension become antagonism. However, we found the risk of joint effect still bigger than the risk of obesity or OC users alone.

Conclusions

Our study indicated that obesity, OC users and their joint effects significantly increased the risk of hypertension among women in thirteen Provinces in Indonesia. The way better to prevent being obese than preventing using OC in the case of hypertension. For further research it would have been better if the variable not nominally categorized but depend on the usefulness and richness of the research. Also it would have been wonderful to include the long time using OC and using cohort design study. Besides, we recommend for future research for including waist circumference (WC), if the research conducted in Asian Population.

Ethical Considerations: This study was approved by The Research and Community Engagement Ethical Committee Faculty of Public Health Universitas Indonesia (Ket-605/UN2.F10/PPM.00.02/2019).

Competing Interests: The authors declared that no competing interests exist.

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Tithonia Diversifolia vs Catechin: Role in Regulating Blood Glucose, Malondialdehyd, and Super Oxide Dismutase Level on Rat Induced Diabetes Mellitus and High-Fat Diet

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Abstract

Tithonia diversifolia (TD) is known as medicine plant which contains antioxidants and has been known as anti-diabetic medicine. Diabetic patient has increased blood glucose, reactive oxygen species (ROS), and malondialdehyd (MDA) level. In other side, the super oxide dismutase (SOD) level commonly attenuates. The aims of this study was to analyze the effect of Tithonia diversifolia and catechin in blood glucose, malondialdehyd (MDA), and Super Oxide Dismutase (SOD) level on diabetic and high fat induced rats.

The design of this study was Randomized Posttest Control Group Design using Wistar strain rats which were divided into 4 groups. After treatment, all groups of rats were sacrificed to take blood samples then measured blood glucose, MDA and SOD level. Statistical analysis of data to examine differences in treatment and control was conducted by one way Anova test with a 95% confidence level (α=0.05). There was difference of glucose level (p=0.020) between control and treatment groups, but there were no differences in MDA level (p=0.103) and SOD level (p=0.207).

Keywords: *Tithonia diversifolia, catechin, malondialdehyd, super oxide dismutase, blood glucose level, diabetes.*

Introduction

Tithonia diversifolia is known as medicine plant. It has several functions relate with disease prevention and treatment. The habitats of Tithonia diversifolia is in tropical and subtropical area. In Indonesia, this plant is known as Kembang Bulan. Traditionally, all part of this plant, especially leaves, use to treat wounds, abdominal pain, abscesses, malaria, fever, hepatitis, and diabetes mellitus [1]. It contains active substances such as: alkaloids, saponins, saponin glycosides, tannins, balsam, and volatile oil [2].

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Alkaloids play as antioxidant. It reduces ROS which causes oxidative damage by peroxidation, oxidation of cellular lipid, proteins, and DNA. Saponins can reduce blood cholesterol level, plays as anti-hepatic fibrosis agent, and acts as anti-inflammation [3–5]. Tannins are polyphenolic compound which in certain dose has role as anti-diabetic, anti-adipogenic, antipyretic, and antiseptic [2,6].

It is commonly found in diabetic patient that the number of ROS increase and leads to damage tissue, such as: damaging macro-vascular and micro-vascular which contributes to the other complication development like nephropathy and retinopathy diabetic [7]. ROS incline to attack phospholipid bilayer in cell membrane. The stabilized final substrate which produced by this reaction called malondialdehyde (MDA), which could be the marker of the amount of free radicals which damaging human tissues.

MDA blood level in diabetic patient which has heart complication is higher than diabetic patient without complication [8]. The similar condition also found in diabetic patient with insulin therapy than without insulin therapy [9]. The increasing amount of MDA is marker of increasing lipid peroxidation, which imply the reduction amount of body's antioxidant [10]. Antioxidants in the body include enzymatic and non-enzymatic antioxidants.

One of enzymatic antioxidants is superoxide dismutase (SOD). It has role as a catalyst in the reaction of changing radical superoxide anion to hydrogen peroxide and oxygen molecule. It has important function in protecting cell from damaging. In type 2 diabetic patients, SOD inhibit the complication of nephropathy and retinopathy diabetes mellitus [11]. Extracellular SOD has big responsibility in protect pancreas beta cell from ROS's damaging.

According to the description above, researchers thought that it's necessary to conduct research about Tithonia diversifolia leaves extract and its effects to MDA, SOD, and blood glucose level in rats induced diabetes and high fat diets, comparing with catechin's action as comparative drugs.

Material and Method

The research's design was Randomized Posttest Control Group Design. Animals that used in this study were Wistar strain rats (Rattus norvegicus), male, age between 2-3 months, weight between 150-200 grams and physically fit obtained from the Animal Implementing Unit Faculty of Medicine, Universitas Airlangga Surabaya Indonesia. The sample size were 8 rats x 4 groups = 32 rats.

Rats were given food special pellet feed and drinking ad libitum. After being adapted for 1 week, rats were divided in 4 groups. Each group of white rats contained 8 rats. There were 1 control group and 3 treatment groups. Control group was given aquades. Treatment groups were induced a dose 60 mg/kg bw of Streptozotocin (Stz) and giving a high-fat diet for 30 days. In 31st day, D2 group was given 100 mg/kg bw extract, and D3 group was given catechin as comparative drug at 10 mg/kg bw for 7 days. After that, all rats were taken for blood samples to measure the level of blood glucose, MDA and SOD level. Data were analyzed by SPSS 21 with ANOVA to measure the difference blood glucose, MDA, and SOD level among each group.

Finding:

Table 1. Average glucose levels (mg/dl) in the control and treatment groups

Groups	n	Mean±SD	Min	Max	p
D0	8	150,375±15,070	130,00	175,00	0,020*
D1	8	226,625±74,630	152,00	359,00	
D2	8	203,75±62,490	142,00	327,00	
D3	8	234,125±122,804	130,00	490,00	

*p<0.05 imply there is significant difference between groups

Table 2. Difference blood glucose level among each control group and treatment groups

Paired Groups	p
D0 – D1	0,002*
D0 – D2	0,007*
D0 – D3	0,105
D1 – D2	0,442
D1 – D3	0,505
D2 – D3	0,878

*p<0.05 imply there is significant difference between paired groups

Table 3. Average MDA levels (mg/dl) in the control and treatment groups

Groups	n	Mean±SD	Min	Max	p
D0	8	108,171±26,669	75,801	156,250	0,103
D1	8	176,404±60,078	108,897	284,040	
D2	8	209,237±129,145	106,246	503,730	
D3	8	196,647±87,953	95,298	389,162	

Table 4. Average SOD levels (mg/dl) in the control and treatment groups

Groups	n	Mean±SD	Min	Max	p
D0	8	0,138±0,059	0,052	0,257	0,207
D1	8	0,091±0,039	0,005	0,145	
D2	8	0,109±0,044	0,037	0,202	
D3	8	0,142±0,065	0,018	0,239	

Tithonia diversifolia leaves extract is more effective to reduce blood glucose level than catechin, the comparative drugs. It has been proven by the results which showed that D2 had lower level of blood glucose than D3 (Table 1). Tithonia diversifolia extract can also be a barrier to hyperinsulinemia in diabetes with streptozotocin induction and a high-fat diet. There was differences in the average glucose levels in the control and treatment groups.

The elevation of blood glucose happened in rat-induced streptozotocin. This is consistent with Samarghandian et al that blood glucose increases significantly after streptozotocin induction[12]. Olukunle et al reported that Tithonia diversifolia leaves extract significantly decrease the plasma glucose of rats induced diabetes mellitus because it improved insulin action in the cellular level[13]. Thongsom et al analyzed the total phenolic content of Tithonia diversifolia leaves is 55.92 ± 4.45 GAE mg/g and antioxidant capacity is 93.09 ± 37.91 uM TEAC/mg dry weight [14]. This amount is higher than antioxidant capacity in dietary vitamin and mineral.

Sibul et al reported significant positive correlation between phenolic and total antioxidant activity which reduce the number of reactive oxygen species (ROS) [15]. It has been known that increasing ROS also happen in diabetes patient. In diabetes mellitus patient, ROS attacks beta cell of pancreas and imply to inflammation and cell dysfunction [16]. Tagne et al reported that Tithonia diversifolia also contained flavonoid which showed as anti-diabetic effect by reducing the oxidative stress [1,17]. Flavonoid enhances GLUT-2 expression in beta cell and GLUT-4 translocation [18]. Therefore, it could be concluded that flavonoid improves glucose metabolism [19].

Nagao et al reported that there was no significant difference in blood glucose level between control and catechin treatment group in diabetes mellitus patients [20]. Other study showed that catechin injection with dosage more than 20 mg/kg BW among treatment group can reduce glucose level [12]. It has been proven that catechin has anti-diabetic effect [21]. In this research, the dosage of 10 mg/kg BW catechin which was given to rats induced diabetes. It can be concluded that the catechin dosage in this study was lower, therefore blood glucose level wasn't reduced significantly.

Streptozotocin also causes the elevation level of MDA, beside of blood glucose level [12]. MDA can be used as the marker of oxidative stress level, especially in lipid peroxidation [10]. In diabetes mellitus patient, oxidative stress alters macronutrients metabolism and increases risk of endothelial dysfunction and trigger the development of atherosclerosis [12]. Oxidative stress increases the progression and complication development of diabetes mellitus. MDA level increased significantly in diabetic patient with complication [22]. According to the result, MDA level of D2 treatment group was higher than other group. D2 was treated by Tithonia diversifolia leaves extract. D3, group with comparative drugs – catechin – had lower level of MDA than D2. Meanwhile, there was no significant different between each groups in this study ($p>0.05$).

Thongsom et al reported that injection of Tithonia

diversifolia in rats induced diabetes was significantly reduce the MDA level in liver and pancreas tissue [14]. It refers that Tithonia diversifolia treatment reduce the lipid peroxidation. Injection of catechin also related with increasing antioxidant enzyme and reducing lipid peroxidation [12]. Catechin enriched was observed decrease intra-abdominal fat [23] which is correlate with degenerative disease incidence, such as: diabetes mellitus. In this study, treatment groups were given high fat diet.

More amount of catechin in treatment group, the MDA level was lower [12]. According to the result (Table 3), in the dosage of 10 mg/kg BW; catechin was more effective to reduce MDA level than Tithonia diversifolia leaves extract in the dosage of 100 mg/kg BW. It also relates with catechin's role in preventing the onset of pancreatic islet cells from damaging of ROS [24,25].

Hyperglycemia also causes increased production of ROS because of auto-oxidation of glucose and protein glycolylation [14] [26]. Free radicals are molecules that are easy to diffuse and damage the biomolecules which cause short-lived cells [27,28]. In normal metabolism, ROS is produced from oxygen molecular [29]. During oxidative stress, the amount of antioxidant is not enough to handle free radicals or ROS which play an important role in several diseases' pathophysiology by means of redox reaction [30,31]. Higher redox reaction between ROS and antioxidant caused higher level of MDA level.

SOD acts as a catalyst in superoxide anion dismutase which is radical into hydrogen peroxide and oxygen molecules. SOD has a role in protecting cell and tissue damage caused by ROS. SOD is an antioxidant that acts against superoxide, both in the kidneys which are at risk of developing diabetes nephropathy or in eye tissue which is at risk of developing diabetes retinopathy [7]. Research in diabetic induced mice found that there was a decrease in SOD and other antioxidant enzymes in liver tissue [32].

The result showed that there was no significant difference of SOD level between all groups, but catechin-treatment group had higher level of SOD than Tithonia diversifolia group (Table 4). SOD activity has increased in catechin-treat-diabetic rats [12]. The SOD level was higher in treatment group with highest dose of catechin [12]. When the SOD level is high, more amount of SOD prevents human body from ROS; therefore the level of MDA is lower. The other side, when the SOD level is low; the body's antioxidant capacity is also lower and MDA is formed more because of ROS.

Conclusion

Streptozotocin induction causes changes in glucose levels in the treatment group. There were differences in glucose levels in the treatment and control groups. Both Tithonia diversifolia and catechin have antioxidant and anti-diabetic action which relate with blood glucose and oxidative stress. In this study, oxidative stress was determined by MDA and SOD level. There were no significant differences in MDA and SOD level, even the MDA level was higher in Tithonia diversifolia leaves extract treatment group and SOD level was higher in catechin treatment group.

Conflict of Interest: All authors who have participated in preparation of this manuscript declare that we have no conflict of interest.

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Comparison between the Antioxidant Activity of Volatile Oil and Hydrosol in Eucalyptus Camaldulensis (Young and Adult) Leaves

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Abstract

Essential oils have been reported as an important compounds in the pharmaceutical industries for their antibacterial and antioxidant activity. This study was conducted to investigate the antioxidant activity of Eucalyptus *camaldulensis* volatile oil and hydrosol obtained from young and adult leaves. Oil extraction was carried out by using steam distillation method. The antioxidant power was estimated by using the DPPH (2,2-diphenyl-1,1-picrylhydrazyl) and FRAP(ferric reducing antioxidant power) assays. Butylated hydroxy toluene (BHT) was used as positive control. The results show that young leaves of *E. camaldulensis* provide essential oil (2-4%), while in adult leaves the oil percentage was (1-2%). The IC50 of volatile oil in young leaves for the DPPH and FRAP assays was (237.178 and 243.664 µg/ml) respectively while in adult leaves IC50 was not observed. IC50 of hydrosol in young leaves of DPPH and FRAP assays was higher as compared with control and adult leaves. The results also showed that the antioxidant activity of volatile oil and Hydrosol in adults leaves was more than in young leaves. The current study revealed the possibility of using this volatile oil and hydrosol as a natural antioxidants.

Keywords: *Hydrosol, volatile oil, antioxidants, Eucalyptus camaldulensis.*

Introduction

Aromatic plants are used in phytotherapy due to their essential oils and various biological activities such as antioxidant. Exogenous antioxidants can be a natural compounds like vitamins, flavonoids, anthocyanin but it can be also a synthetic like butylated hydroxy toluene[1]. Natural antioxidants are an important compounds to prevent the free radicals during the interaction of oxygen with molecules[2]. These radicals are dangerous when they react with DNA and cell membrane[3]. Antioxidants delay or inhibit the oxidation processes by affecting the free radical or molecular oxygen[4], so they prevent cellular damage and inhibit the pathway for cancer, aging and diseases[5,6]. They also used in foods and cosmetics industries to prevent undesirable oxidation processes. The synthetic antioxidants like butylated hydroxytoluene (BHT) and butylated hydroxyanisole (BHA) are possibly toxic so finding natural antioxidants has been increased during the last years[7,8]. Some herbal extracts and oils formulations have been proved as an important antioxidant agents[9,10]. *Eucalyptus* belongs to Myrtaceae family, it has 500 species endemic to Australia and neighboring territories. Some species have been introduced into Iraq,one of these species is *E. camaldulnesis*[11]. The leaves of this species is sensitive to dust pollution[12] and change as the tree progress from juvenility to adulthood[13], so it can be found as a young (growing tips),Mature (six mo.), aged(12-18 mo.).

The medicinal properties of *Eucalyptus* reside in its oil which is secreted and stored in the sub-dermal cavities[14]. The biological effects of this oil include: antiviral,antioxidants, antibacterial, antifungal and treat the respiratory infections as well as sinusitis[15]. The essential oil in association with hydrosol can be obtained through steam distillation process for the leaves of this aromatic plant. The hydrosol contains some of the water-soluble compounds of the essential oil which are the same of those present in volatile oil. Unlike essential oils that should be diluted prior to application attach the skin hydrosol can generally be used directly on the skin without further dilution[16]. Hydrosol has been used in different industries such as food and cosmetic as well as to the biological agriculture and soil fertilization[17]. This study was done to determine for the first time,

comparison of the antioxidant activity for *Eucalyptus camaldulensis* leaves in Iraq. This work allowed highlight in the influence of plant leaves maturity on the quantity,activity and chemical composition of essential oil and hydrosol.

Material and Method

Plant collection and extraction: Leaves (young and adult or aged) of *E. camaldulensis* Dehn**.** were harvested in October 2018 from University of Baghdad. These leaves were washed and dried in shade for three days. Dried leaves of this plant were chopped and semi grinded into small pieces and submitted to steam distillation using the Clevenger apparatus for 4 h[18]. Yield percentage was calculated according to the oil ratioequation[19].

$$\text{Extracted oil ratio} = \frac{oil\ volume}{sample\ weight} \times 100$$

The (DPPH) assay: 2, 2-diphenyl-1, 1-picrylhydrazyl: All the chemicals in this study were obtained from Sigma (Sigma-Aldrich GmbH, Germany). 2ml of samples at the concentrations (200,400.600,800,1000 µg/ml) were added to the volume(1ml) of theDPPH in methanol solution. The mixture was shaken andstand for half an hourin dark place. Spectrophotometer was used to measure the absorbance of the solution (yellow color) at 517 nm. Percentage (I%) of DPPH was collected as follow :

$$I\% = 100 \times \frac{A\ control - A\ sample}{A\ control}$$

A control=Absorbance of contro land A sample is the absorbance of test compound. Butylated hydroxytoluene (BHT) was used as a standard.[20]

The FRAP (ferric reducing antioxidant power) method: Volatile oil and Hydrosol reducing powers were determined according to procedure of[21]. Different concentrations of the extracts were mixed with phosphate buffer and 1% of water solution from potassium ferricyanide. This mixture was kept at 50°C for 20 min. Trichloroacetic acid was added to the mixture and then centrifuged at 3000 rpm for 10 min. The supernatant was mixed with distilled water and FeCl3 solution. The absorbance was read at 700 nm.

Statistical Analysis: The data were reported by using mean±standard deviation for three replicates. The IC50 value µg/ml was calculated by using Excel programme depended on the logarithm(Log.) of each concentration.

Results and Discussion

Plant Oil Yield: The results show that young leaves of *E. camaldulensis* provide more essential oil (2-4%),while in adult leaves the oil percentage was (1-2%). These leaves provide quantitatively different yields. This result agree with[22] which referred that the aged leaves yield less oil than recently mature. On the other hand the different stages of growth affected the oil yield and its chemical compositions[23].

DPPH scavenging activity and Ferric Reducing Antioxidant power (FRAP) of volatile oil from Eucalyptus leaves: The results show that the antioxidant activity increased by increasing the concentrations. This activity of volatile oil in adult leaves was higher than young leaves in the two different assays (Figure 1 and 2). At the concentrations (200,400µg/ml),the highest value of DPPH activity was obtained from the volatile oil in adult leaves in addition to its highest FRAP activity for all concentrations as compared with control. On the other hand, the IC50 (the half maximal inhibitory concentration) in both DPPH and FRAP assays was not observed in volatile oil of adult leaves while the IC50 of volatile oil in young leaves for the two assays was (237.178 and 243.664 µg/ml) respectively, as compared with BHT(233.001 and 208.855 µg/ml).

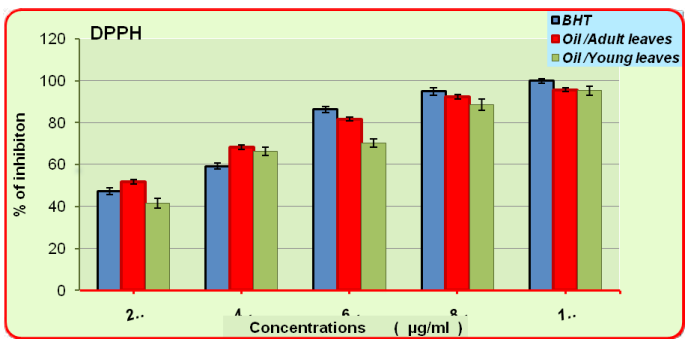

Figure 1: DPPH scavenging activity of E. camaldulensis volatile oil in adult and young leaves.

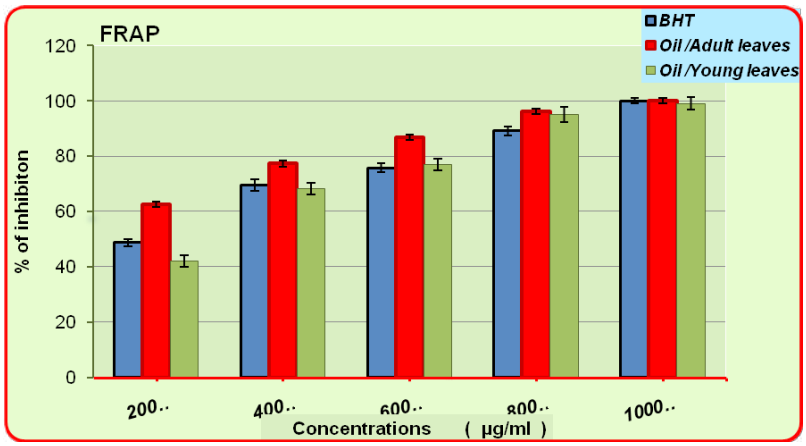

Figure 2: Ferric Reducing Antioxidant Potential of E. camaldulensis volatile oil in adult and young leaves.

DPPH scavenging activity and Ferric Reducing Antioxidant power (FRAP) of Hydrosol from Eucalyptus leaves: (Figure 3 and 4) show that the antioxidant activity of hydrosol in adult leaves was higher than young leaves in the two different assays. At FRAP assay the hydrosol of adult leaves at concentrations (400,600,800) revealed more activity as compared with control.

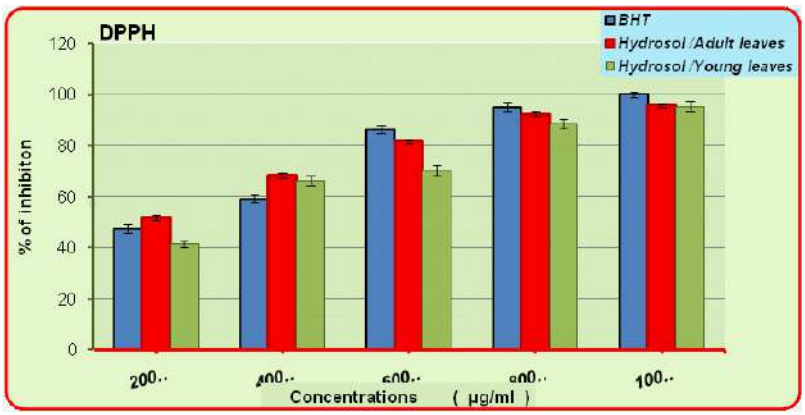

Figure 3: DPPH scavenging activity of E. camaldulensis Hydrosol in adult and young leaves.

On the other hand, IC50 of hydrosol in young leaves of DPPH and FRAP assays was higher as compared with control and adult leaves**.**

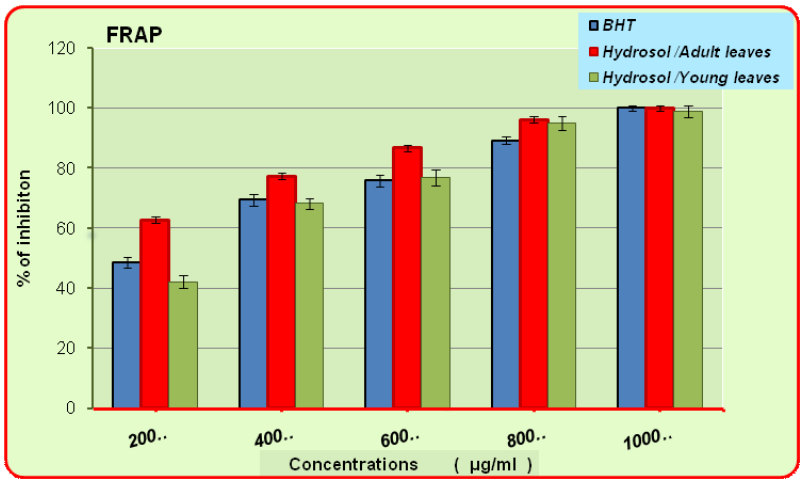

Figure 4: Ferric Reducing Antioxidant Potential of E. camaldulensis Hydrosol in adult and young leaves.

The differences in oils activity found in this experiment between different leaves may be related to the modifications of the oil composition during leaves maturation. The chemical analysis of *E, camaldulensis* essential oil revealed the presence of different compounds including: 1.8-cineole, limonene, α-pinene and p-cymene[24]. The antioxidant activity of volatile oil belongs to these compounds and the differences in their concentrations. The stronger free radical inhibitors are active at low concentrations(lower IC50)[25].The disappeared of the IC50 in both DPPH and FRAP assays in volatile oil of adult leaves revealed that it could be appeared in lower concentration than 200 which represented the lower one in this study, so this study indicate that *E. camaldulensis* volatile oil in adult leaves was more active than the control itself.

Conclusion

The volatile oil and hydrosol of *Eucalyptus camaldulensis* can be used as a natural antioxidants. There is an economical importance by using hydrosol as a raw material in the cosmetic industry and food preservation.

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required.

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Self Care Behaviour of the Diabetic Patients in a Primary Health Center in Bali

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Abstract

The main problem of diabetes management is the patient's attitude toward their illness, because they have different concepts and beliefs. This study was to investigate the illness perception, the motivation, and the selfcare behavior in patients type 2 diabetes. This research was used cross-sectional approach. The sample size in this study was 177 patients with diabetes mellitus type 2. Stratified random sampling was used in this study. Motivation itself accounted for 43.2% of the variance in diet, 11.4% of the variance in exercise, 9.1% of the variance in blood sugar testing, 11.7% of the variance in medication adherence, 10.1% of the variance in foot care, $p < .005$. Illness perception accounted for 23.4% of the variance in selfcare behavior, 23.4% of the variance in selfcare behavior, 23.4% of the variance in selfcare behavior, 23.4% of the variance in selfcare behavior, 23.4% of the variance in selfcare behavior $p < .005$.

Keywords: *Illness perception, motivation, selfcare, diabetes mellitus.*

Introduction

Elderly population is increasing worldwide. Such a rapid growth in elderly population has challenged health care systems, to meet the complexities of caring for such a vulnerable population who are at risk of various health problems and disabilities[(1)]. Individuals with diabetes are at increased risk of developing microvascular and macrovascular complications, which could be prevented or delayed through essential self-care activities[(2)]. Nonadherence to self-care behaviors stems from a number of patient-related factors, including a decrease in motivation, self-efficacy, health literacy, and impaired disease perception[(3)].

Furthermore, there is a growing body of evidence corroborating that the perception of the disease plays an important role in the degree of compliance[(4–6)]. Previous research has shown that the extent to which patients adhere to diabetes self-care recommendations is strongly related to their perceptions of their illness and its treatment[(7)]. Illness perceptions are the central concept of the common-sense model of self-regulation of health and illness[(8)]. One's perception of his or her illness, i.e., illness perception, has been considered a critical psychosocial construct that could motivate the person with diabetes to undertake the required self-care activities. According to the common-sense model of self-regulation (CSM-SR)[(9)], individuals who are faced with a health threat, such as experiencing a diagnosis, tend to form emotional and cognitive representations that determine the selection of coping procedures and behaviors in response to the perceived health problem as well as the evaluation of treatment effects.

Motivation is an important conceptual variable in diabetes regimen adherence. As self-care for diabetes is ongoing, motivation may be best conceptualized for the process rather than a specific goal[(10)]. Cross-sectional studies have also found that motivation is associated with diabetes self-care behaviors[(11–13)]. Initiating and maintaining such a complex and demanding regimen is heavily dependent on developing and

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sustaining motivation, which is the key to establishing goal-directed behavior[14,15]. While adjustments to health behavior are not inherently motivating[16], autonomous self-motivation can play a crucial role in adherence to a dietary regimen in diabetes[17]. The aim of this study was to investigate the illness perception, the motivation, and the selfcare behavior in patients with type 2 diabetes and its association with the demographic information.

Method

A descriptive cross-sectional design was used for data collection from individuals with T2DM. Data were collected from January 2018 to February 2018. A multistage stratified proportional sample design was used to draw a random sample of 177 patients; the 2 stratification criteria were educational level and, sufficient number of patients with type 2 diabetes coming to the public health center, and public health center distribution of the practices (11 primary health center). The ethical considerations were met. Participants signed an informed consent. Moreover, their privacy, confidentiality, and volunteer participation were ensured. The study was approved by Health Research Ethics Committee Faculty of Nursing Universitas Airlangga (No. 611-KEPK).

Data gathering tool included three questionnaires, the first one was related to demographic information of the patients which was created by researchers, the second one was The Brief IPQ (Illness Perception Questionnaire) and the third one was the Treatment Self-Regulation Questionnaire (TSRQ). The Brief IPQ (Illness Perception Questionnaire) has nine items. The items were developed by forming one question that best summarized the items contained in each subscale of the IPQ-R. [6].

The Treatment Self-Regulation Questionnaire-diabetes (TSRQ-diabetes) is a measure used an assessment approach introduced by Ryan and Connell[18]. We used a version of the TSRQ adapted for diabetes[19]. The Summary of Diabetes Self-Care Activities—Revised (SDSCA) is a measure that includes scales for commonly recommended diabetes self-care behavior. Validity for the original subscales has been supported by correlations of the SDSCA with other measures of diet and exercise[20].

Descriptive statistics were used to describe the demographic information, motivation, levels of illness perception, and self-care behaviors. Multivariate linear regression analyses were conducted to examine the predictive relationships among illness perception, motivation and each self-care behavior. All data were analyzed using the SPSS statistical software package (version 16.0, SPSS Inc., Chicago, IL, USA), and a value of $P < 0.05$ was considered significant.

Result

Table 1 lists the characteristics of the 177 participants. The average age of the subjects was 57.35 ±4,89 years (range 36-65 years), and 53.1% of the subjects were male. The duration of T2DM in the participants was 5.85 ± 3.29 years. The mean Social economy status (Rp) was 1,532,800 (±1,098,200), and the mean BMI (kg/m2) was 22.96 (±2,93). In multiple regressions, after adjusting for relevant covariates, duration of diabetes ($\beta = 0.309$, $P < 0.05$), social economy status ($\beta = 0.405$, $P < 0.05$), personal control ($\beta = 0.202$, $P < 0.05$), treatment control ($\beta = 0.296$, $P < 0.05$), and concern ($\beta = 0.197$, $P < 0.05$) significantly accounted for the diet in self care behavior. Duration of diabetes ($\beta = 0.309$, $P < 0.05$), BMI ($\beta = 0.200$, $P < 0.05$), identity ($\beta = -0.233$, $P < 0.05$), assesses illness comprehensibility ($\beta = 0.094$, $P < 0.05$), autonomous regulation ($\beta = 0.267$, $P < 0.05$), and controlled regulation ($\beta = -0.356$, $P < 0.05$) significantly accounted for the exercise in self care behavior. BMI ($\beta = 0.269$, $P < 0.05$), emotions ($\beta = -0.255$, $P < 0.05$), autonomous regulation ($\beta = 0.433$, $P < 0.05$), and controlled regulation ($\beta = -0.454$, $P < 0.05$) significantly accounted for the blood sugar testing in self care behavior. Social economy status ($\beta = 0.161$, $P < 0.05$), treatment control ($\beta = -0.223$, $P < 0.05$), assesses illness comprehensibility ($\beta = 0.184$, $P < 0.05$) significantly accounted for the foot care in self care behavior. Autonomous regulation ($\beta = 0.260$, $P < 0.05$) significantly accounted for the medication adherence in self care behavior.

Table 1: Number and percentage of participants according to demographic characteristics

Variable	Mean(SD)	N = 177	%
Age (36-65), y	57.35 (±4,89)		
Gender			
Male		94	53.1
Female		83	46.9
Duration of diabetes, y	5.85 (± 3.29)		
Social economy status, Rp			
≥ Rp 2,173,000		51	28.8
< Rp 2,173,000		126	71.2
BMI, kg/m²	22.96 (±2,93)		

Table 2: Mean (SD) of participants according to illness perception, motivation, and self care behavior

Variable	Mean	(SD)	Range
Illness Perception			
Consequences	5.45	2.90	0-10
Timeline	4.47	2.62	0-10
Personal control	8.5	1.56	0-10
Treatment control	9.06	1.33	0-10
Identity	6.59	2.07	0-10
Concern	9.25	1.04	0-10
Assesses illness comprehensibility	7.2	1.97	0-10
Emotions	5.81	2.77	0-10
Motivation			
Autonomous regulation	3.33	0.34	1-4
Controlled regulation	3.26	0.35	1-4
Self care Behavior			**0-7**
Diet	4.98	1.24	0-7
Exercise	2.6	1.4	0-7
Blood sugar testing	1.07	0.95	0-7
Medication adherence	5.63	1.8	0-7
Foot Care	2.01	1.56	0-7

Table 3: Multistep linear regression on the association of demographic characteristics, motivation, and illness perception with self care behavior

Step	Variabel	Diet	Exercise	Blood sugar testing	Medication adherence	Foot Care
		R^2	R^2	R^2	R^2	R^2
1	Age	0.295*	0.098*	0.079*	0.021	0.051
	Gender					
	Duration of diabetes					
	Social economy status					
	BMI					
2	Consequences	0.432*	0.114*	0.091*	0.117*	0.101*
	Timeline					
	Personal control					
	Treatment control					
	Identity					
	Concern					
	Assesses illness comprehensibility					
	Emotions					
3	Autonomous regulation	0.014	0.049*	0.084*	0.040*	0.006
	Controlled regulation					

Note: *Significant at $P < 0.05$

Discussion

Overall, illness perception dimensions were associated with self-care behavior. Patients who perceived they had the ability to control their diabetes, reported to have been more physically active and to have followed the general guidelines for healthy eating and diet more often. These findings seem to support previous studies that identified control perceptions to be particularly influential on health behavior[7,21]. In addition to some of the illness perceptions dimensions, the presence of complications was found to be associated with certain self-care behavior, namely physical activity and foot care. These findings seem to partly support previous studies[22,23] suggesting that the perceived urge and need to make behavior changes primarily appear to arise in the presence of diabetes related symptoms.

We believe the relatively low proportion of significant associations between illness perceptions and self-care found in this study might be explained by several factors. First, it is difficult to determine whether the self-care behavior, with the exception of foot care, were actually performed as a part of the diabetes treatment regimen or rather as a part of an already existing lifestyle. Furthermore, the fact that we studied the effects of separate illness perception dimensions, rather than illness perception clusters, may

have contributed to the relatively few associations found with self-care behavior and lifestyle [24]; particularly considering the high perceived controllability and low perceived consequences that were generally found in this study. The low variation in selfcare behavior and illness perceptions in this group of relatively recently diagnosed T2DM patients, however, did not allow for clustering of perception dimensions.

This study found that autonomous and controlled motivation had a positive influence on exercise, but not on general diet, blood-glucose testing, medication adherence, and foot care. These findings are in line with other studies demonstrating a positive association between autonomous motivation and self-care behaviors [10,17,25,26] and between controlled motivation and exercise [10]. In the present case, controlled motivation was related to exercise in the first months after the diabetes course, whereas autonomous motivation was related to exercise in the long term, 12 months after the course. Thus, although controlled motivation can influence self-care behaviors, we can expect autonomous motivation to lead to more sustainable behavior change [10]. However, it should be noted that our results are inconsistent with other studies indicating that autonomous motivation is positively associated with dietary selfcare or blood-glucose testing [10,17,26].

Our results are consistent with previous research showing a positive association between autonomous motivation and success in maintaining health-related behavior. This body of work includes studies of smoking cessation, maintaining reduced body mass index and increased exercise following a weight loss program and improving diet and exercise among individuals with coronary artery disease [27–29]. Also consistent with this literature, feeling that one should perform self-management tasks because of the expectations of others or because one feels guilty (controlled motivation) did not predict frequency for any of the target behavior in our study [10]. In contrast to diet and blood glucose testing and in contrast with previous reports in the literature, our findings did not support an association between autonomous motivation and exercise. This may have been an artefact, at least in part, due to the very low rate of exercise among the participants in our sample. Another consideration is that our participants were not recruited as part of a training program, as was the case in studies reporting the associations between autonomous motivation and health-related behavior [27–29].

Conclusion

The illness perception and the motivation in patients with type 2 diabetes are associated with the self care behavior.

Conflict of Interest: The authors declare that they have no conflict of interest.

Ethical Approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

Informed Consent: Informed consent was obtained from all individual participants included in the study.

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Cut off Point of Insulin-Like Growth Factor-I (IGF-1) for Prediction of Child Stunting

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Abstract

Objectives: The aim of this study was to determine cut off point of Insulin-Like Growth Factor-I (IGF-1) for prediction of child stunting.

Method: This prognostic model was conducted subdistrict of Pasaman and West Pasaman, West Sumatera, Indonesia from July-November 2018. This study was performed on 185 children aged 0-3 years, consist of stunting group 94 respondents and not stunting 91 respondents. Determination of insulin-like growth factor-I (IGF-I) expression levels using the qRT-PCR method. Total RNA from blood samples of stunting and normal children was extracted using Trizol and stunting assesment using z-score index Height per age where the result ≤-2 SD is stunting. The mean difference of IGF-I level was analyzed by independent sample T test. A two-tailed *P*-value of <0.05 was considered statistically significant. Cut off point analysis using receiver operating characteristic (ROC) curve, the results show sensitivity, specificity and an accuracy. Data were analyzed using the SPSS version 20.0

Results: The results showed IGF level in child stunting 10.44±9.88 ng/ml and 10.09±10.08 ng/ml in child not stunting. Cut off point IGF-I for prediction of child stunting is 6.63 ng/ml with 64.2% sensitivity, 60.0% specificity and accuracy 61,3%.

Conclusion: This analysis confirmed IGF-I can predict child stunting with enough accuracy for classification.

Keywords: *Child, classification, IGF-1, prediction, stunting.*

Introduction

Stunting is the best summary measure of chronic malnutrition in children. Approximately one-quarter of children under age 5 worldwide are stunted. Stunting is an intractable public health problem affecting around one-third of children in developing countries.[1] Stunting underlies 14–17% of child deaths globally and causes long-term cognitive defects, fewer years and poorer performance at school, lower adult economic productivity and an increased risk of stunting into subsequent generations.[1,2] Poor linear growth begins *in utero*, continues during the first 2 years of life and is largely irreversible thereafter.[3] Despite its high prevalence, the reasons for stunting among children living in impoverished conditions remain uncertain. Although inadequate diet contributes to poor growth, the best nutritional interventions have only a modest impact on stunting.[4] Diarrhea has been implicated in the causal pathway to stunting but, possibly because children frequently show catch-up growth between diarrheal episodes,[5] the association has been surprisingly weak in many studies. The role of the gut in mediating stunting

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has been relatively overlooked until recently, when attention has refocused on the possible contribution of enteropathy to poor growth in early life.[6,7]

Stunting affects one-third of children in developing countries, but the causes remain unclear. Stunting began *in utero* and was associated with low maternal IGF-1 levels at birth. Inflammatory markers were higher in cases than controls from 6 weeks of age and were associated with lower levels of IGF-1 throughout infancy.[1]

Stunting may therefore be driven by intestinal damage and chronic inflammation in addition to dietary inadequacy. Furthermore, since stunting begins *in utero*, the maternal inflammatory environment may have an important influence on fetal growth. However, few longitudinal studies have evaluated the mechanisms underlying poor growth among infants in developing countries. We hypothesized that an important cause of child stunting is exposure to chronic, low-grade inflammation during fetal and postnatal life, which suppresses production of IGF-1 perturbing the growth hormone axis early in life. We hypothesized that enteropathy leads to low-grade inflammation, which suppresses the growth hormone-IGF axis and mediates stunting.[8,9]

Method

Study design and research sample: This prognostic model was conducted subdistrict of Pasaman and West Pasaman, West Sumatera, Indonesia from July-November 2018. This study was performed on 185 children aged 0-3 years, consist of stunting group 94 respondents and not stunting 91 respondents. The sample size was calculated using the formula for continuous data on population.

Operational definitions: The variables of this study divided into independent variables, that is IGF-1; and a dependent variable, that is stunting.

Ethics statement: The study was approved by the ethical committee board of Faculty of Medicine Universitas Andalas, Padang City, Indonesia Number 495/KEP/FK/2017. Written informed consent was obtained from all respondents.

Data collection technique: Determination of IGF-I expression levels using the qRT-PCR method. Total RNA from blood samples of stunting and normal children was extracted using Trizol and stunting assesment using z-score index Height per age where the result ≤-2 SD is stunting.

Data analysis: The quantitative variables were recorded as Mean±SD, median and percentage. The mean difference of IGF-I level was analyzed by independent sample T test. A two-tailed *P*-value of <0.05 was considered statistically significant. Cut off point analysis using receiver operating characteristic (ROC) curve, the results show sensitivity, specificity and an accuracy. Data were analyzed using the SPSS version 24.0.

Results

Data characteristics of the respondents (Table 1).

Table 1: Characteristics of the respondents

Variables	Nutrition Status		p value
	Stunting (n=94)	Not Stunting (n=91)	
Child Characteristics			
Child's age (months), mean±SD	23.97±6.74	24.44±6.95	0.640
Birth weight (gram), mean±SD	3284.04±480.65	3210.88±478.83	0.301
Family Characteristics			
Family head's education, f(%)			
Low	62 (65.9)	42 (46.1)	0.003*
Moderate	13 (13.9)	18 (19.8)	
High	19 (20.2)	31 (34.1)	
Salary per months (Rp), mean±SD	717375±144713	1417349±202534	0.081
Family member, mean±SD	4.78±1.61	5.07±1.73	0.240

Table 1 known there were statistically significant mean difference child's age, birth weight, salary per months of head family and familiy member between stunting and not stunting groups (p>0.05). There was statistically association family head's education between stunting and not stunting groups (p<0.05).

Mean difference of IGF-I levels between child stunting and not stunting (Table 2).

Table 2: Mean difference of IGF-I levels between child stunting and not stunting

Variable	Mean±SD	p value
Child stunting (ng/ml)	10.44±9.88	0.047
Not stunting (ng/ml)	10.09±10.08	

Table 2 showed IGF-I level in child stunting 10.44±9.88 ng/ml and 10.09±10.08 ng/ml in child not stunting. There was statistically significant mean difference IGF-1 levels with stunting (p<0.05).

Determination of the cut off point of IGF-I level (Figure 1).

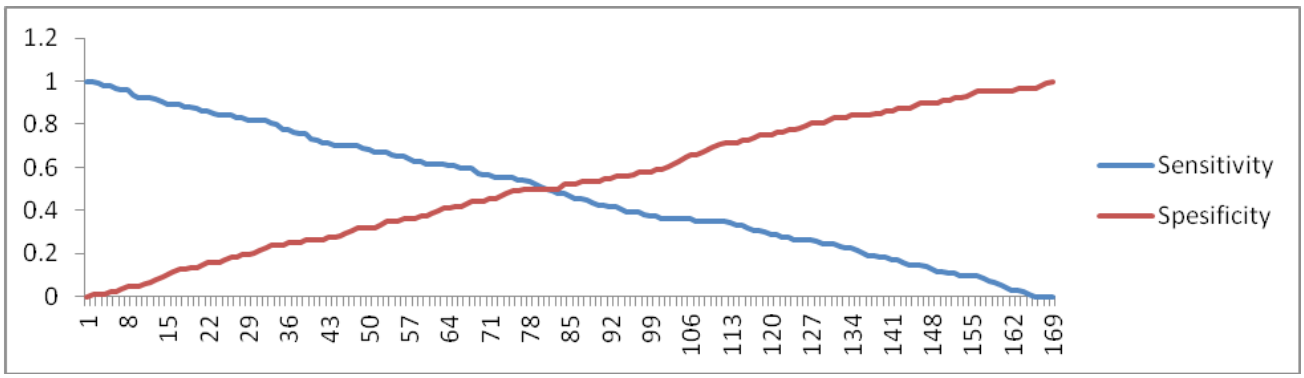

Figure 1: Determination cut off point of IGF-I for prediction of child stunting

Figure 1 showed cut off point of mechanistic target of rapamycin complex 1 (mTORC1) for prediction of child stunting in cut off point 77. The cut off point from the optimal cut off point of lines and the acquisition of sensitivity and specificity (Table 3).

Table 3: Cut off point IGF-I from the optimal cut off point of lines and the acquisition of sensitivity and specificity

No	Cut off point	Sensitivity	1 - Specificity	Sensitivity	Spesificity
1	-1	1	1	1	0
2	0.214	1	0.988636364	1	0.011364
3	0.49	0.989362	0.988636364	0.989361702	0.011364
4	0.562	0.978723	0.988636364	0.978723404	0.011364
5	0.593	0.978723	0.977272727	0.978723404	0.022727
6	0.645	0.968085	0.977272727	0.968085106	0.022727
7	0.707	0.957447	0.965909091	0.957446809	0.034091
8	0.748	0.957447	0.954545455	0.957446809	0.045455
9	0.7685	0.93617	0.954545455	0.936170213	0.045455
10	0.7895	0.925532	0.954545455	0.925531915	0.045455
11	0.81	0.925532	0.943181818	0.925531915	0.056818
12	0.841	0.925532	0.931818182	0.925531915	0.068182

13	0.8825	0.914894	0.920454545	0.914893617	0.079545
14	0.9135	0.904255	0.909090909	0.904255319	0.090909
15	0.9345	0.893617	0.897727273	0.893617021	0.102273
16	0.976	0.893617	0.886363636	0.893617021	0.113636
17	1.0275	0.893617	0.875	0.893617021	0.125
18	1.0585	0.882979	0.875	0.882978723	0.125
19	1.0895	0.882979	0.863636364	0.882978723	0.136364
20	1.1305	0.87234	0.863636364	0.872340426	0.136364
21	1.1615	0.861702	0.852272727	0.861702128	0.147727
22	1.1825	0.861702	0.840909091	0.861702128	0.159091
...					
77	6.63	0.542553	0.5	0.642553191	0.6
78	6.6815	0.531915	0.5	0.531914894	0.5
79	6.7025	0.521277	0.5	0.521276596	0.5
80	6.723	0.510638	0.5	0.510638298	0.5
...					
167	37.4665	0	0.022727273	0	0.977273
168	45.3645	0	0.011363636	0	0.988636
169	53.673	0	0	0	1

Table 2 showed based on analysis, we obtained cut off point IGF-I for prediction of child stunting is 6.63 ng/ml with 64.2% sensitivity and 60.0% specificity. Accuracy for cut off point of IGF-I showed in Receiver Operating Characteristics (ROC) (Figure 2).

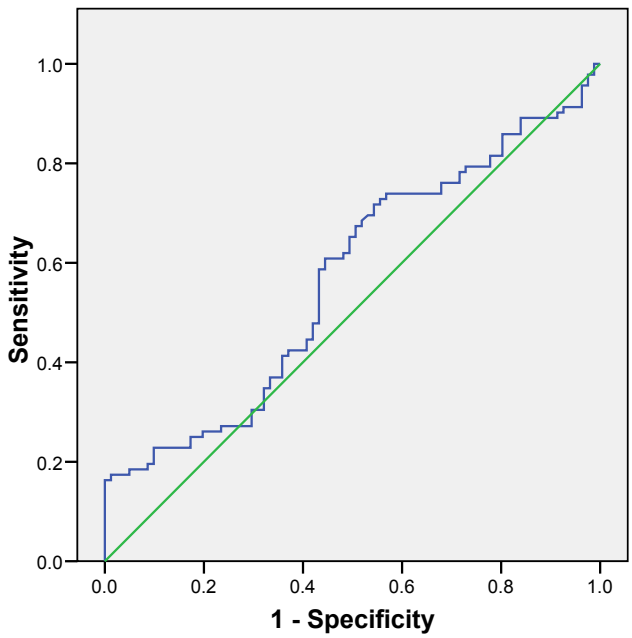

Figure 2: Receiver Operating Characteristics (ROC) for known accuracy of cut off point of IGF-I for prediction of child stunting

Figure 2 showed accuracy of IGF-I cut off point is 61.3%, it is means poor clasification.

Discussion

The results showed IGF level in child stunting 10.44±9.88 ng/ml and 10.09±10.08 ng/ml in child not stunting. Cut off point IGF-I for prediction of child stunting is 6.63 ng/ml with 64.2% sensitivity, 60.0% specificity and accuracy 61,3%..

Levels of IGF-1 were generally low compared to reported values from European infant cohorts.[10,11] However, levels of IGF-1 and its principal binding protein IGFBP3 were consistently lower among stunted compared to non-stunted infants from as early as 6 weeks of age. Whether reduced IGF-1 levels are a cause or a consequence of stunting is difficult to ascertain from our data, but given the well-characterized function of IGF-1 at growth plates, we speculate that lower levels are likely to mediate stunting in early life. In chronic inflammatory diseases such as juvenile idiopathic arthritis and Crohn's disease, elevated proinflammatory cytokines mediate growth failure through a reduction in circulating IGF-1.[8,9] Similarly, in our cohort of apparently healthy Zimbabwean infants, elevated inflammatory markers (even within the clinically normal range) were associated

with reduced IGF-1 levels. The association between low-grade chronic inflammation and suppression of the growth hormone-IGF axis was apparent soon after delivery and may account for the decline in linear growth that occurs from birth among African and Asian infants.[3] IGF-1 levels remained lower in stunted infants throughout the first year of life, but by 18 months levels were similar between groups. This suggests that a window of opportunity may exist in infancy, during which interventions to reduce inflammation and increase IGF-1 may improve linear growth.

Birth weight was related to infant IGF-1 at birth, which in turn was associated with the inflammatory status of the mother-infant dyad. The infant inflammatory milieu was closely related to the level of maternal inflammation at birth. We speculate, based on these associations, that inflammation during pregnancy may 'set' the infant inflammatory axis, which in turn influences the level of IGF-1 in early life. Optimizing the health of pregnant women may be essential to impact antenatal and postnatal stunting. Infants who became stunted were born to mothers who themselves were shorter than mothers of non-stunted infants. However, it was striking that over one-quarter of mothers of cases were overweight or obese. The relationship between maternal and fetal nutritional status is therefore complex and requires further investigation, particularly in view of the emerging obesity epidemic in countries that are experiencing the nutrition transition.[12,13,14]

In summary, our data suggest that stunting is influenced by both maternal and infant factors. Antenatally, maternal nutritional and inflammatory status may impact fetal growth, leading to intrauterine stunting and low birth weight; postnatally, low-grade inflammation early in life is associated with stunting.

Conclusion

This analysis confirmed IGF-I can predict child stunting with enough accuracy for classification.

Conflict of Interest Statement: The authors declared no potential conflicts of interest

Funding: Not applicable

Ethical Clearance: The study was approved by the ethical committee board of Faculty of Medicine Universitas Andalas, Padang City, Indonesia Number 495/KEP/FK/2017. Written informed consent was obtained from all respondents.

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Effect of Generative Learning Strategy with Visual Technologies in Learning Some Basic Skills and Motor Abilities for 5-6-Years Kindergarten Children

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Abstract

This study aims to determine the effect of generative learning strategy with visual technology in learning some basic skills and motor abilities for 5-6-years kindergarten children. A two groups experimental design was used to guide this study. The study included male children who age 5-6-years who were selected from the Lote Tree Kindergarten at Al-Rusafa side, Baghdad City for the academic years 2017-2018. The study included 24 children who were selected and assigned into two groups; study and control, using a simple random sample method. The study sample represented 40% of the target population.

The researcher selected the skills of jogging, jumping, and the abilities of mobile balance, and the eye-hand compatibility as dependent variables. The generative learning strategy with visual technology in learning were applied to the children of the experimental group for 12-weeks of the second semester of the academic year 2017-2018, at a rate of two sessions per week on Sunday and Thursday. The total number of learning sessions was 24 sessions.Data were analyzed using the statistical package for social science (SPSS).The researcher concludes that the generative learning strategy with visual technology in learning has proven to be effective in learning jogging and jumping skills and learning the ability of mobile balance and eye-hand compatibility for study subjects.

Keywords: *Generative Learning Strategy; Basic Skills and Motor Abilities*

Introduction

The Generative Learning Theory was introduced by Wittrock; an American educational psychologist in 1974. The Generative Learning Theory rests on the notion that learners can actively integrate new ideas into their memory to enhance their educational experience Wittrock theorized that these learners processed information actively, by generating relationships between what they already knew and what they were encountering anew. He provided insight into how students who were successful at mastering new material made sense of new information they encountered and built up their working knowledge of a subject[1].

Wittrock's theory of generative learning had asimple premise. He theorized that individuals generate their own meanings of new material they encounter by building relationships between the new material and their prior knowledge. The fundamental premise of Wittrock's theory was that people enhanced their learning through this act of generating their own personal knowledge of information they received. The greater the generative activity engaged in by a participant while the new material is received, the greater is the learning that occurs. The learner may see relationships between incoming information and something already known. The learner may perceive a new relationship between one element of the new information and other elements within it.

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Whether a learner sees relationships between incoming information and prior knowledge, or within different segments of incoming ideas, what was common to both these activities was generatively.

The act of generating ideas about the information and forming relationships between incoming information and a growing body of knowledge was the key to improved learning.

According to generative learning theory, to comprehend a complex topic, learners need to "electively attend to events and generate meaning for events by constructing relations between new or incoming information and previously acquired information, conceptions, and background knowledge" [(2)]. In this theory, comprehension and understanding result from the generation of relations both among concepts and between experience or prior learning and information. In other words, learners need to make their own meaning by integrating new information with current existing knowledge, rather than just transferring the presented information into memory [(3)].

The researcher believes that the attention to learning strategies; that adopt their steps and determinants fromthe literature related to education, is a priority for those looking for modernity and improving the educational outcomes of the kindergarten children as best as possible.This; in turn, cast a shadow on the importance of giving these strategies the applied role in educational sessions in the motor or skilled learning within the limits in terms ofthe learner's age and gender to increase their activity in the educational environment,

This cannot be predicted unless it is subject to systematic steps to academically studying it in order to arrive at the scientific facts that call for its application. Thus, there was an actual need and importance to try this strategy in order to achieve its practical benefit in the physical education classes for kindergartens when working on improving motor abilities and basic skills. That is, working on training children to organize ideas and the process of retrieving experiences and information and linking them to the situations they face is a requirement not only limited to the educational process, but also includes reviewing the steps of human building, particularly in the developing societies that rely on the familiar to avoid risking updates. Therefore, the study problem has emerged in an attempt to answer the following question: I it possible to adopt advance strategies for kindergarten children that enable to reorganize the cognitive structure and activate the recall processes for the acquired experiences in their age stages in order to improve the learning of some basic skills and motor abilities? Especially on investing in the vision sense through optical stimuli and their colors, not only to encourage but to increase the level of optical stimulus threshold to reach the desired goals in the education class for this school stage.

The study aims to:

1. Learn about the effect of the generative learning strategy with optical technologies in learning some basic skills of Kindergarten children aged (5-6) years.
2. To identify the effect of the strategy of generative learning strategy with optical technologies to learn some of the motor abilities of kindergarten children aged (5-6) years.

The researcher hypothesized that:

1. There are statistically significant differences between the results of the pretest and posttest of some basic skills of kindergarten children aged (5-6) for the two study groups.
2. There are statistically significant differences between the posttest results for the study and control groups in some basic skills of kindergarten children age (5-6) years.

Method

An experimental, pre-post design with two groups was used to guide this study, which is defined as "deliberate and precise change of the conditions determining the study phenomenon and observing the results of change in that phenomenon.It also defined as the use of experiment in testing the hypotheses." [(4)]

In the experimental group,there was a combination of the generative learning strategy and the optical technologies as one independent variable.For the control group,the children receive the conventional teaching method.

Sample and Sampling: The target population includes children who age 5-6-years (N = 60) in the Lote Tree Kindergarten at Al-Rusafa side, Baghdad City for the academic year (2017/2018) of (60) children. The study sample were selected purposively(n = 24) who represent (40%) of the target population;six children

were selected for the pilot study. The study sample were randomly, equally assigned into the experimental and control groups (n = 12) children in each group.

Measuring tools and study procedures: The jogging and jumping skills and the mobile balance and the eye-hand coordination were selected to fit the specificity of the study. Thereafter, the specialized measurement sources for children were selected to choose the following tests:

1. Jogging skill test (Subhi and Abdel Moneim)[5]. The rate is for 10-meters in the measurement unit of the time of passing the distance per second.
2. Jumping skill test for Sargent (valid for all ages)[6] in the measurement unit the distance of jumping by the name.
3. Mobile balance test (standing on one foot with bending and extending the trunk with touching the ground by the arms) in the measurement unit of degree[7].
4. Eye-leg compatibility test (jumping on the numbered cycles)[15] in measurement of time per second.

After conducting the pilot study and the completion of the pretests, the researcher applied the generative learning strategy on the children in the experimental group (n = 12) for 12-weeks period for the second semester, the 2017-2018 academic year at a rate of 2-sessions per week Sunday, Thursday, starting on February 25th, 2018 to May 17th, 2018. The total number of sessions is (24). While, the children in the control group have received the conventional teaching method. The statistical package for social sciences (version 24) was used to analyze data. The statistical measures of frequency, percent, mean, standard deviation, independent-sample T-test, and the paired-sample T-test were used.

Results and Discussion

Table 1: Equivalence between study groups in the pretests

Tests and measurement units		Study Group		Control Group		T-value	Sig.	Assess.
		Mean	SD	Mean	SD			
Basic skills	Jugging (Seconds)	5.449	0.238	5.522	0.196	0.816	0.423	NS
	Jumping (cm)	11.486	0.283	11.422	0.198	0.644	0.526	NS
Motor abilities	Mobile balance (Degree)	5.558	0.264	5.708	0.254	1.417	0.17	NS
	Eye-leg coordination	6.468	0.366	6.401	0.308	0.482	0.634	NS

Assess. = Assessment, df = Degree of freedom, SD = Standard deviation, n = 12 for each group, Significant on p-value ≤ 0.05, df = (n-2) = 24

Table 2: Pretest-posttest for the study and control groups

Tests and measurement units	Group	Pretest		Posttest		F	SD	T-value	p-value	Sig.
		Mean	SD	Mean	SD					
Jugging (Seconds)	Study	5.449	0.238	3.772	0.043	1.678	0.262	22.192	0.000	S
	Control	5.522	0.196	4.43	0.213	1.092	0.278	13.614	0.000	S
Jumping (cm)	Study	11.486	0.283	17.458	0.251	5.973	0.311	66.497	0.000	S
	Control	11.422	0.198	14.541	0.414	3.119	0.417	25.901	0.000	S
Mobile balance (degree)	Study	5.558	0.264	10.625	0.226	5.067	0.448	39.187	0.000	S
	Control	5.708	0.254	7.583	0.597	1.875	0.697	9.32	0.000	S
Eye-leg coordination	Study	6.468	0.366	4.199	0.108	2.268	0.344	22.866	0.000	S
	Control	6.401	0.308	5.492	0.183	0.909	0.335	9.403	0.000	S

df = Degree of freedom, SD = Standard deviation, F = F-Test, Sig. = Significance, Number for each group = 12, Significant on p-value ≤ 0.05 in a df = 11 and significance level (0.05)

Table 3: Results of the study and control groups in the posttests

Tests and measurement units		Study Group		Control Group		T-value	Sig.	Assess.
		Mean	SD	Mean	SD			
Basic skills	Jugging (Seconds)	3.772	0.043	4.43	0.213	10.489	0.000	S
	Jumping (cm)	17.458	0.251	14.541	0.414	20.872	0.000	S
Motor abilities	Mobile balance (degree)	10.625	0.226	7.583	0.597	16.512	0.000	S
	Eye-leg coordination	4.199	0.108	5.492	0.183	21.075	0.000	S

Assess. = Assessment, df = Degree of freedom, SD = Standard deviation, n = 12 for each group, Significant on p-value ≤ 0.05, df = (n-2) = 24

Reviewing the results of table (2) reveals the improvements in each of the values of the four variables of the children in the experimental and control groups. Reviewing the results of table (3) displays that the children in the experimental group exceeded their peers in the control group in the results of these dependent variables,

The researcher attributed this to the role of strategy and the appropriateness of integrating photic technologies in the kindergarten games, which had duties the children should complete with the most efficient ability to run, jump, balance and compatibility. This led them to rearrange information and generate new experiences that allow them to complete these duties. There was a role for the photic stimulants in attracting children's attention and facilitating the cognitive processes in terms of what is required to do in the best manner. This strategy is based on the learner's role and activating his/her movement in line with the teacher's follow-up without abolishing the teacher's role. This strategy is presented from the concept of learning theories in the behavioral and cognitive schools in that the learning by which helps to increase the link between the brain stimuli and the apparent muscles of the motor behavior of its purposeful movement, and the reorganization of the child's cognitive structure in drawing the motor program of both skills and the studies abilities. Mahjoob indicates that "The availability of information about a given skill will improve the ability to learn the motor skills more than those who do not have extensive information before training" [(8)]. According to Shehata, "Prior awareness of coordination and balance increases the mechanism of movement and skill performance[(9)]. Chnichov, as mentioned by Shehata, states that "Man learns the responses because of the inter connectedness of experiences[(14)]. Hasan says that "in the first school years, the nervous system develops in the child and thus gets an important stage of development, and that the brain has increased its size to this stage it is continuing to increase."[(10)]

Conclusions and Implications

The generative learning strategy with photic technologies proved their effectiveness in learning the skills of jogging and jumping in kindergarten children aged 5-6-years.

The generative learning strategy with photic technologies proved their effectiveness in learning the abilities to mobile balance and eye-leg coordination in kindergarten children aged 5-6-years.

Implications: The researcher recommends that (1) It is necessary to pay attention to the kindergarten children's cognitive structure to guide them to play in the physical education class, (2) it is essential that the children of Kindergarten should not be viewed from the perspective of learning skills and abilities without taking the role of mind in enabling them to show them, (3) it is vital not to view kindergarten children from the perspective of learning skills and abilities without considering the role of the brain in enabling them to demonstrate such skills and abilities, and (3) It is crucial to equip kindergarten children with different, multiple systems of photic technologies to help in applying different strategies.

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The Effect of Self-Regulated Learning Strategy in Motor Hyperactivity and Learning the Performance of Skill of Jump Shot in Basketball for Freshmen High School Students

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Abstract

The study aims to identify the effect of the strategy of self-regulated learning in the motor hyperactivity and learning the performance of the jump shot skill of the basketball for freshmen high school students. The researchers used the experimental design with the experimental and control groups in pre and post. This study was conducted at Al-Fursan High School, the General Directorate for Education of Al-Rusafa II for the academic year 2017-2018. Male students aged 15-16-years were surveyed using hyperactivity scale to detect the phenomenon that correspond to the study problem. Students who scored (28) on this scale were purposively selected to represent (36.842%) of the original community. They were divided into two equal groups; study and control. Each group included (14) students. The researchers prepared six educational units that are applied in the physical education lesson for the study group. The study results revealed that the self-regulated learning strategy has proved its effectiveness in reducing hyperactivity and its good investment in the physical education lesson. The self-regulated learning strategy proved its effectiveness in learning the performance of jump-shot in basketball for freshmen high school. The researchers recommend that it is necessary to pay attention to the periodic psychometry in the physical education lesson in the high school to detect unwanted behaviors and change them into active and productive behaviors, and training teachers and develop their own abilities in the application of educational strategies in the physical education lesson and caring for the modern of such strategies.

Keywords: *Self-Regulated Learning; Motor Hyperactivity; Jump-Shot.*

Importance

The teaching process should be viewed as a unit that includes (objective, content, and method), and that the lesson; as a whole or parts, is closely linked to these three factors," said Ahmed. "Some of the specialists in the field of physical education teaching that the content of the physical education lesson includes some components, including a compound set of concepts, standards, and facts, and a range of sports performance method(6).

"It is necessary to assess the level of motor development that a student reaches to determine what skills he has learned and what he has not yet learned," said Mona and Jamal. (7)

Pintrichand Zeidner define the self-regulated learning (SRL) strategy as "a meaningful and active process. Learners set their educational goals and then attempt to monitor, organize, and control their cognitive, motivational, and behavioral characteristics, and their orientations in the learning environment".(10)

"The aim of self-regulation is to regulate the personal, behavioral, and environmental factors that influence the learner's performance in learning situations," said Youssef Mohamed. (9)

The learner leaders in the learning groups after roles assignment among them acquire personal and professional skills at a high level, which deepens the concept of learning as the practice facilitates the learning process of the less-experienced students in an organized and supported manner (11).

Hyperactivity is defined as "excessive, inappropriate behavior of the position, no direct goal, inappropriate development of the child's age, negatively affecting and accumulating behavior and increasing in males more than females."[5]

The academic researcher specialized in motor learning and teaching method should differentiate between the types of these behaviors for the purpose of controlling them by adopting the scientific method. Thus, they can control the system in the lesson and enable the teacher to achieve his objectives, shaping the future student personality, in addition to maintaining the spirit of teamwork and cohesion among students. This calls for continuing the scientific efforts to supply the educational process;particularly the physical education lesson,with specialized research including the psychological studies that deal with the study of behavior at different stages of life. The importance of this study lies in the importance of diagnosing and analyzing hyperactivity among middle school students.

Self-regulated learning involves metacognitive (planning, self-monitoring, evaluation, reflection) and motivational (effort, self-efficacy) processes engaged by learners to reach self-set goals [6].

One of the duties of the school is to create and organize a safe learning environment for students who are inherently descended from different social environments and families. This difference is associated with many factors. Usually,such a difference leads them to seek self-affirmation among their peers. This clearly appears in his behavior of dealing with peers which takes different forms. The researchers; throughout their visits to the schools, noticed different, unwanted behaviors including hyperactivity against others that arises among cohort in the physical education lesson, which allows them to move freely and play unrestrictedly compared to other restricted classroom environments. This enables those meant by exploring to observe these behaviors, which require careful measurement with objective tools within the parameters of the psychometric measurement of the methodology of scientific research to suit the students' characteristics, their age, level, and then the educational institutions service to prepare the programs for it later. The problem of the study lies in the researchers' attempt to achieve this diagnosis to find the scientific answer to the following question: Does the SRL strategy help in investing the organization of the excessive students' movement in favor of learning the skillful performance of jump-shot in basketball?

The study aims to (1) identify the influence of the SRL strategy on the hyperactivity of freshmen high school students, and (2)recognize the influence of the SRL strategy on learning the performance of jump-shot skill in basketball for these students.

The researchers hypothesized the following:

1. There are statistically significant differences in the hyperactivity and learning the performance of jump-shot skill in basketball between the pretest and posttest between groups.
2. There are statistically significant differences in the hyperactivity and learning the performance of jump-shot skill in basketball between for the posttest time between groups.

Method

An experimental, pretest-posttest design with two groups; study and control, was used to guide this study.

The boundaries of the research community in this study were represented by the high school freshmen. The study included 76 male students,age 15-16-years, who were recruited from Al-Fursan High School in Al-Rusafa side in Baghdad City. for the academic year (2017/2018).The study participants were selected by surveying using a scale for hyperactivity. Students who score 8 or above on this scale would be involved ($n = 28$) who were purposively selected. They represent (36.842%) of this society. Twenty students were assigned in the pilot study to test the modified version of the scale. Participants in the main study sample were assigned using the simple random sample method; 14 students in each group.

Measuring tools and study procedures: In order to diagnose hyperactivity,the hyperactivity scale developed by Abdul-Ameer[2] was adopted. It consists of 15 items with a total score of (15).Minor modifications and adapting it to 20 students to find the scientific bases. The researchers designed a performance evaluation form that includes three sections of performance the jump-shot in the basketball of (10) degrees. This performance is revealed after the students' videotaping and presented to three specialists in basketball tests.

After preparing the measuring tools for the study experiment, the educational units were prepared using the SRL strategy to employ excess energy from excessive

activity in the sense of the concept of hyperactivity by directing the students well according to the determinants of motor performance of the skill. At the same time,the educational units aim to regulate the cognitive information pertinent to that skill and the harnessing of the learner's energy for proper performance since it is not limited to the accuracy of the scoring, but the movement and harmony of the body parts of the requirements of the optimal performance that helps to such an accuracy later. The teacher's duty is to create the educational environment appropriate for applying such a strategy to be a lesson that is free from restrictions,be concerned with the learners' directions and feedback of self-regulation. Such strategies are considered as meaningful and active learning strategies sought by modern learning schools in various sciences. The educational units have been applied among students with hyperactivity for 45-days in an average of one educational unit per week for the academic year 2017-2018 after finishing the formal school time. Data were analyzed using the statistical package for social sciences (SPSS) version 24. The statistical measures of percentage, arithmetic mean, standard deviation, independent-sample T-test, and paired-sample T-test were used.

Results

Table 1: The equivalence of the study groups in the pretest

Tests	Study Group (n = 14)		Control Group (n = 14)		t	Sig.	Sig. Level
	Mean	SD	Mean	SD			
Hyperactivity	10.5	1.653	10.14	1.875	0.535	0.597	NS
Performance of jump-shot skill	2	0.961	2.43	1.089	1.104	0.28	NS

Significant at $p \leq 0.05$ at 0.05, degree of freedom n-2 = 26

Table 2. Pretest and posttest tests for the study and control groups

Tests and measurement Unit	Group	Pretest		Posttest		Mean difference	Std. Error Mean	t	Sig.	Ass.
		Mean	SD	Mean	SD					
Hyperactivity	Study	10.5	1.653	4.5	0.65	6	1.922	11.683	0.000	S
	Control	10.14	1.875	6.57	0.646	3.571	2.065	6.472	0.000	S
Performance of jump-shot skill	Study	2	0.961	7.71	0.469	5.714	1.069	20	0.000	S
	Control	2.43	1.089	5.29	0.469	2.857	1.167	9.158	0.000	S

n = 14 for each group;Significant at $p \leq 0.05$, degree of freedom = 13at 0.05; S = Significant

Table 3. The equivalence of the study groups in the posttest

Tests	Study Group (n = 14)		Control Group (n = 14)		t	Sig.	Sig. Level
	Mean	SD	Mean	SD			
Hyperactivity	4.5	0.65	6.57	0.646	8.453	0.000	S
Performance of jump-shot skill	7.71	0.469	5.29	0.469	13.706	0.000	S

Significant at $p \leq 0.05$ at 0.05, degree of freedom n-2 = 26; S = Significant

Reviewing the results of Table (2) reveals improvements in the values of the variables of the study and control groups. Reviewing Table (3) displays that the students in the study group members outweighed their counterparts in the control group pertinent to the dependent variables. This finding could be attributed to the role of SRL strategy that enabled the students to reorganize their experiences and information, improve excessive and random movement in the class, and guide it towards proper skill performance that requires aesthetic and quality determinants in the three skill sections. Thus, two objectives were met by one action that is positively reflected on the psychological status in its improvement whatever the reasons for such opportunities. At the same

time, the skilled performance that requires regulating the experience and information as indicated to regulate the movement. As well as,it helped to increase the number of units to six for one skill in improving the values of skill improvement for the performance of this skill in basketball. For the students in the control group, the researchers attribute the improvements to the role of the sports education lesson, and it achieves of educational and learning goals.

Al-Busidistated that SRL differs from self-learning developed by Skinner or using computers. In his theory, Deutsch could determine the relationship form between different organizations of mutual social interdependence(1).

Qatami stated that "The aim of Uzbel is to study the cognitive structure of the learner and the higher mental processes in order to achieve a meaningful learning and increase the efficiency of the processes of cognitive processing of the information using multiple cognitive processes and at reasonable times that facilitate the task of storing these knowledge, their transfer,and integration into the learner's cognitive structures" (8).

Thorndike stated that "The teacher and the learner must determine the characteristics of the good performance so that the practitioner can be organized to be able to diagnose errors and not repeated them and the difficulty to modify," (4)

Conclusions and Implications:

1. The SRL strategy has proved its effectiveness in reducing hyperactivity and good investment in the physical education lesson among freshmen.
2. The SRL strategy has proved its effectiveness in learning the performance of jump-shot in basketball for freshmen.

The researchers recommend the following:

1. It is necessary to pay attention to the process of periodic psychometry in the physical education lesson in the high school to detect unwanted behaviors and turn them into active and productive behaviors.
2. It is necessary to train teachers and develop their own abilities in the application of educational strategies in the physical education lesson and paying attention to the modern of such strategies.

Conflict of Interest: The researchers report no conflict of interest.

Funding: This study did not receive any funding from any agency.

Ethical Clearance: A permission to conduct this study was obtained from the ethical committee in the College of Basic Education, University of Mustansiriyah.

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Influence Organizational Citizenship Behavior (OCB) on Performance Nurses Public Health Centre in the District Tuban

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Abstract

Organization will successfully when employees not only do their tasks anyway but also want to do duty extra as wants to work, help one another, give advice, participate effectively, giving best services, and want to use time it works effectively but not all an employee with like willingly want to do[1]. A nurse having organizational behavior citizenship behavior (OCB) the atmosphere than last year in order to have a comfortable so as to cause a working relationship which harmonious in order to increase performance workers to reach organizational goals[2].

The study was observational analytic, population nurses public health centre in the district tuban were 24 people, a random sampling of sampling simple .Independent variable organizational citizenship behavior and dependent variable performance nurses and research instruments using sheets kuisioner with data analysis spearman use the rank.

Is the organizational citizenship behavior (OCB) of performance nurse

Keywords: *Organization, citizenship, behavior, performance nurse, public health centre.*

Introduction

Human resources have a very crucial role in addition to the other. owned organization. An organization can run well and get completely as performance produced by every other component running smoothly and mutually supported[3].

One attitude or behavior to improve the performance of nurses in the structure of course behavior that leads to positive things that are known as organizational behavior (OCB) citizenship that is the individual that exceeds demand and the role of. But not all employees voluntarily want to does more their formal task on their job description contains[4]

One of the ways to enhance the performance of nurses is by the presence of organizational behavior (ocb citizenship in organization so that it will give rise to the atmosphere a harmonious work[5] .Hence, very important a nurse having organizational behavior citizenship behavior (OCB) the atmosphere than last year in order to have a comfortable so as to cause a working relationship which harmonious in order to increase performance workers to reach organizational goals[6].

Material and Method

This research design of observational analytic, the population is nurses public health centre in the district tuban a total of 24 people, simple sampling technique random sampling .The independent variable citizenship organizational behavior and the dependent variable for the performance of nurses and an instrument the research uses a sheet of the questionnaire was test with data analysis using the spearman rank[7].

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Findings:

Table 1: The distribution of respondents ocb nurse

No.	OCB	f	Prosentase
1	Height	16	69,6%
2	Medium	4	17,4%
3	Low	3	13,0%
	Total	**23**	**100%**

Based on the table above can be seen from 23 (100%) respondents said that the majority of 16 (69,6%) respondents own high of ocb

Table 2: The Distribution Of Respondent Based On The Nurses

No.	Performance nurse	f	Prosentase
1	Good	12	52,2%
2	Medium	10	43,5%
3	Low	1	4,3%
	Total	**23**	**100%**

Based on the table above can be seen from 23 (100%) respondents said that the majority of 12 (52,2%) respondents have a good performance

Table 3: The influence of organizational behavior citizenship (OCB) on the performance of nurses

OCB	Performance Nurse			Total
	Good	Medium	Low	
Hight	11(68,8%)	5(31,3%)	0(0,0%)	16(100%)
Medium	1(25,0%)	3(75,0%)	0(0,0%)	4(100%)
Low	0(0,0%)	2(66,7%)	1(33,3%)	3(100%)
Total	12(52,2%)	10(43,5%)	1(4,3%)	23(100%)
Value	α = 0,05	*p* = 0,005		r = 0,563

From the table above it can be seen from 23 (100%) of respondents that almost most of which have ocb high with a good track record in 11 (68.8%) of respondents, having ocb being with the performance of being 3 (75,0%) and that has ocb low with the medium of performance 2 (66.7%)

Based on an analysis by using spss for windows with the spearman rank α= 0,05 obtained the p = 0,005 value $p < \alpha$ so variable ocb have significant influence on performance a nurse with the correlation was (r = 0,564) and direction positive correlation means the higher ocb better performance nurse at work.

Discussion

Behavior identification organizational citizenship (OCB) in nurses: Most of nurses in public health centre in the district tuban having organizational citizenship behavior (OCB) the height. Organizational citizenship behavior (OCB) in generally believed that to achieve excellence must have their individual performance of as high as, because basically individual performance influences the performance as a whole ocb organization is the act of someone out kewajibanya not consider the interests of the himself[8].. This behavior have changed in line how passionate organization on welfare levels individual and appreciation organization against their contribution[9]. The majority of respondents having ocb high, because some aspects of: alturism, civic virtue, conscientiousness, courtesy, sportmanship.OCB also is the unique individual activities in working and is the customs or manners performed voluntarily, no formal is part of the job, and indirectly identified by a system of rewards[10] .So it can be concluded that ocb also called the behavior extra role of concurrent given individual exceeds main function[4].

This research result indicates that there are 16 respondents own ocb high and 3 respondents own ocb. lowIt is in because the willingness of nurses to take the role of (role) that exceeds a lead role in an organization, so called as behavior any extra roles (extra role).It is to achieve the success of an organization when its members not only working on his main job just, but also want to do extra duty, like the will to cooperate, help each other, provide input into, actively involved, provide service extra, as well as wanting to use the hours are effectively.

Identification performance nurse: Performance is the result of a work or process of an end of a activities. The performance is a motion or action that have been carried out in a conscious geared to achieving a goal or a specific target. The performance was a result of working to the awards by a person or a group of people in accordance with their respective authorities and responsibilities of each party, as forms of businesses in achieving legally organizational goals, not unlawful and in accordance with moral and ethical[11].

The performance is an illustration of the level of achievement of implementing a program or policy activities in realizing the target, the purpose of, the vision and mission of the organization that was poured through strategic planning an organization .For that reason the performance of individual basically can be influenced by

a number of factors such as the quality of, the quantity, the effectiveness of, timeliness and independence[12].

From the research the majority of respondents having a good track record .It was because the performance of supported by a factor of an external and an internal, the internal factor, that is, that deals with the properties of a person .While the external factor that is the factors that influences the performance someone who originated in the neighborhood[13].

As behavior, attitude, and the colleague, subordinate or leadership of, work facilities and climate organization .Where factors that might have an impact on working system given by organization or the hospital .Individual ocb influences the performance, and therefore this behavior is leading to the social interaction of members of an organization are more reliable, reducing the conflict, and improve the efficiency[14].

The influence of organizational citizenship behavior (OCB) on the performance of nurses: The result of this research is the organizational citizenship behavior (OCB) on the performance of nurses. OCB influential positive and significantly to the performance of individual[8]. It is anyone had showed that the of individuals having an attitude of my doubts but towards their job of his colleagues or help with the work of his colleagues the more one is high performance general of the agriculture ministry, of individuals having an inclination to favor the relevant organisation s with the role of and decrease the participation in a central organization, of individuals having the level of consciousness of doing things which includes in this data collection referred to the dispatch priorities the presence of the use of the time of work[15]. The individual had tinggat awareness in working eat, employee performance will be good too individuals having a polite and manners, organization individuals having sportifits in working involving a willingness to tolerate discomfort true and risk jobs without the complaining employees own attitude sportsmanship in working for the good performance these individuals[16].

Research conducted by researchers from the data can be proved the organizational citizenship behavior (OCB) by means of distributing the sheets for two times a week.This is evidenced by the results of research of 23 (100) percent of respondents said that almost entirely having ocb high performed well 11 (68,8%), respondents having ocb was with performance and 3 (75,0%) and who has low ocb with performance and 2 (66,7%).This karenakan willingness nurse to take the roles of (role) beyond, primary role in an organization so called as the behavior of the role of extra (extra-role).

It is to achieve the success of an organization when its members not only do, main function of only but also want to do the extra, as a willingness to cooperate,, help each other inform, active, provide service extra, and will want to make use of their working time effectively[17].

Conclusion

The influence of organizational behavior citizenship (OCB) on performance tuban public health centre in the district nurse.

Ethical Clearance: Ethical clearance of this study was taken from Ethical Committee of Public Health Faculty Airlangga University, Indonesia.

Source of Funding: This study was self funding by authors.

Conflict of Interest: There is no conflict of interest in this study.

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Combined Exercise Effects on Lipid Profiles in Hypertensive Patients

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Abstract

Objective: The purpose of the study was to examine combined aerobic and resistance exercise training effect on lipid profiles in hypertensive patients.

Method: A total of forty-six hypertensive patients aged between 31 and 45 years were randomly assigned into two groups: control group (n=23) and exercise group (n=23). Total cholesterol (TC), high density lipoprotein cholesterol (HDL-c), low density lipoprotein cholesterol (LDL-c), and triglycerides (TGs) data were collected at baseline and after 16 weeks of the study period. Analyses of within group and between group comparisons were done using paired sample t-test and independent sample t-test, respectively.

Results: Pre-intervention data of TC, LDL-c, TGs, and HDL-c were homogeneous compared with groups (P>0.05). After completion of the study significant between group mean change difference was found in TC (-7.2 mg/dl; P=0.0001), LDL-c (-10 mg/dl; P=0.0001), TGs (-14.3 mg/dl; P=0.0001), and in HDL-c (3.8 mg/dl; P=0.001). In EG participants performed combined aerobic and resistance exercise training.

Conclusions: Combined aerobic and resistance exercise training significantly reduced TC, LDL-c, TGs and significantly increased HDL-c levels in hypertensive patients. Public awareness promotion should be designed and implemented by concerned bodies for hypertensive patients to realize the importance of combined exercise trainings and thereby increases their adherence to exercise programs.

Trial Registration: Clinicaltrials.gov Identifier: NCT03029767 on 20/01/2017.

Keywords: *Combined aerobic and resistance exercise, Lipid profiles, Hypertensive patients*

Introduction

The behavioral change of contemporary public is associated with increasing of urbanization and these behavioral changes lead people to rise of inactive lifestyle[1]. In modern urbanized society to prevent cardiovascular and other disease levels of physical activity are clearly insufficient[2]. Physical inactivity raises risk of cardiovascular diseases (CVD), mainly hypertension (HTN) [3]. Raised occurrence of CVD in adolescents and adults is associated with low fitness levels [4], a small level of high density lipoprotein cholesterol (HDL) and elevated levels of low density lipoprotein cholesterol (LDL-c) [5]. Raised levels of total cholesterol (TC) and low level of HDL-c are among the main risk factors for HTN [6]. It is well recognized that CVD in general and HTN in particular is related to high levels of TC, LDL-C, triglycerides (TGs), and

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with low levels of HDL-c. Leading sedentary lifestyle plays great role in the risk of HTN [7]. Adherence to the exercise training is a crucial aspect for the achievement of the maximum significance of the intervention on HTN [8]. Hypertensive individuals inadequately adhere to appropriate treatment and the suggested lifestyles [9]. Studies reports showing sedentary lifestyle, rising in low income countries like Ethiopia, causing acceleration in the prevalence of HTN and hypertensive patients have low adherence to exercise in Ethiopia[10, 11]. In human beings continued primary HTN has an effect on different body parts [12]. Adjustment of lifestyles, together with increased participation in exercise training should be the primary alternative to fight the rising spread of HTN in low- and middle income countries[13]. For the urban communities presently in Ethiopia for exercise training appropriate emphasis is not given [14]. Involvement in exercise training on a regular basis is a significant non pharmacological approach to reduce CVD [15, 16]. Persons those continue to engage in physical exercise on a regular basis have been revealed to have a decreased risk of CVD, this may be because of performing exercise training can positively change blood lipid profiles by increasing HDL-c and reducing TGs concentrations [17].The risk for an increase of CVD may be decreased by raising HDL-C and by reducing levels of LDL-C and TGs [18]. Combined aerobic and resistance exercise training will give participants the special advantages of each type of exercise [19]. To the best of our knowledge studies were not carried out in Ethiopia regarding combined aerobic and resistance exercise training as an alternative treatment and preventive lifestyle intervention approach for mild hypertensive patients, mainly in the present study area. Hence, the purpose of this study was to evaluate the combined aerobic and resistance exercise training effect on lipid profiles in hypertensive patients.

Material and Method

Study Area: The study was conducted at Hawassa University Referral Hospital (HURH), Hawassa City administration, Southern Region. Hawassa is the capital city of, Southern Region, located 275 km from Addis Ababa the capital city of Ethiopia.

Study design and participants: This study was registered in clinicaltrials.gov Identifier: NCT03029767 and conducted from February 20/2017 to June 17//2017 in Southern Ethiopia at HURH. Stage 1 hypertensive patients in the age range of 31 to 45 years; individuals who gave written informed consent, participants who live in the study area for the period of study, individuals who are on a single anti-hypertensive drug were included in the study. Pregnant women, individuals with known renal and cardiac problems, diabetic patients, participants who consume medications for lipid, and females who use contraceptives were excluded from the study.

Randomization: Forty six eligible participants were randomly assigned to exercise group (n=23) and control group (n=23) using a stratified random sampling method after acquisition of signed informed consent and eligibility assessment. The allocation of eligible participants in the exercise group (EG) and the control group (CG) was done by a statistician who did not take part in the study by means of computer produced random numbers in pre prepared and sealed numbered envelopes.

Procedures: The EG engaged in combined aerobic and resistance exercise training for 16 weeks. The CG participants did not take part in any structured exercise intervention program, but they sustained their usual daily activities during the period of study and were completed medical symptom's questionnaire forms monthly for the study period. The exercise intervention was given for 48 uninterrupted sessions, three sessions per week for the total of 16 consecutive weeks. To familiarize study participants with the types of exercise and its dosage two familiarization sessions were carried out before continuing the main exercise intervention and with the help of that the participants of the study became familiar to study the procedures of exercise intervention. The exercise intervention was supervised by an exercise physiologist. The EG performed 23 minutes aerobic exercises and 22 minutes resistance exercises. Intensity of exercise was progressive. Participants performed aerobic exercise (brisk walking) for 30 to 40% of heart rate reserve (HRR) or 9-11 rate of perceived exertion (RPE) from first to fourth week, and 40-60% of HRR or 12-13 RPE from fifth to sixteenth week. In addition to aerobic exercise eight resistance exercises were also made by EG. These were biceps curl, triceps extension, shoulder press, squat, heel raise, side leg raises, lower leg lift and curl-up. Resistance exercise was performed using one set and one minute rest between exercises. Intensity of resistance exercise was 30 to 40% of 1 repetition maximum (1RM) for upper body part and 50 to 60% of 1RM for the lower body part. Resistance exercises were conducted alternating between lower-body and upper- body exercises. At baseline five milliliters of

venous blood sample were collected after 48 hours of vigorous physical activity and after ten to twelve hours of overnight fasting in a sitting position from an antecubital vein from all participants. The blood sample collection was done early in the morning from 8 AM to 10 AM Analysis of lipid profiles was conducted using serum sample. For the test of TGs and TC enzymatic colorimetric assay technique was applied, whereas direct homogeneous enzymatic colorimetric assay technique was used for the test of LDL-c and HDL-c. The senior laboratory technologist of HURH collected the blood samples. Quality control samples were analyzed before performing of patient sample and sideways with patient samples for checking the right functioning of instruments and lab reagents including technical acts. Further, standard operating procedure was strictly followed for all laboratory performances from sample collection to result releasing. Post intervention data were collected following similar procedures to baseline data.

Statistical Analysis: Data entry and analysis were done using Statistical Package for Social Sciences (SPSS) Version 20. Categorical variables were summarized as frequencies, and the change was summarized in percentages, while mean values, and standard deviations were tabulated for continuous variables. Comparison of quantitative variables at the pre-intervention and after post-intervention of the same group was analyzed with paired sample t-test. Comparison of continuous variables between intervention and CG was performed using an independent sample t test. Finally, in all situations, the significance level was set at $p<0.05$.

Results

Baseline characteristics of study participants: A total of 46 (20 females and 26 males) study participants were enrolled in the study, of them 44 completed the study. However, one individual (male) from both study groups was discontinued and their data not included in the analysis. In the EG who completed the study, adherence to exercise was 98% and the mean attendance of the study participants was 47 from 48 total exercise sessions. There were no statistically significant differences between the mean age and lipid profiles between groups (P-value >0.05) (Table 1).

Table 1: Baseline between groups' comparison of lipid profiles of the study participants

Variables	EG	CG	p-value
Mean age in years	38.8(±4.3)	38.3(±4.2)	0.72
Mean TC in mg/dl	180(±13.2)	178.2(±10.4)	0.6
Mean LDL-c in mg/dl	104.4(±10.5)	103.5(±7.9)	0.76
Mean TGs in mg/dl	162.4(±16.9)	159.8(±10.8)	0.54
Mean HDL-c in mg/dl	42.6(±3.1)	42.4(±2.4)	0.8

EG= exercise group; CG=Control group; TC=total cholesterol; HDL-c; high density lipoprotein cholesterol; LDL-c; low density lipoprotein cholesterol; TGs; triglycerides; mg/dl=milligram per deciliter

Post exercise between group comparisons of lipid the profiles of study participants: After 16 weeks in EG mean TC, LDL-c and TG decreased significantly compared to CG. However, mean HDL-c significantly increased in EG compared to CG (Table 2).

Table 2: Comparisons of lipid profiles of study participants

Variables & Groups	Baseline	16 Weeks	Between Group Mean Change Difference	P-value
TC mg/dl				
Combined exercise	180(±13.2)	177(±12.53)	-7.2	0.0001
Control	178.2(±10.4)	182.4(±10.3)		
LDL-c mg/dl				
Combined exercise	104.4(±10.5)	99.1(±10.48)	-10	0.0001
Control	103.5(±7.9)	108.2(±8.05)		

Variables & Groups	Baseline	16 Weeks	Between Group Mean Change Difference	P-value
TGs mg/dl				
Combined exercise	162.4(±16.9)	154.3(±19)	-14.3	0.0001
Control	159.8(±10.8)	165.9(±12.07)		
HDL-c mg/dl				
Combined exercise	42.6(±3.1)	44.5(±3.19)	3.8	0.001
Control	42.4(±2.4)	40.6(±2.5)		

Discussion

This study was aimed to examine the effect of combined aerobic and resistance exercise training on TC, HDL-c, LDL-c, and TGs in hypertensive patients. Findings from the present study showed a significant reduction in TC, LDL-c, and TGs and a significant increase in HDL-c in EG compared to CG. The findings of the current study are similar to previous studies that also found significant decrement in TC, LDL-c, and TGs and significant increase in HDL-c[20, 21] in EG compared to CG. Various studies conducted in hypertensive patients and their reports showed that TC, LDL-c, and TGs were decreased significantly and HDL-c increased significantly in combined aerobic and resistance exercise participants [20, 21]. The findings of these studies agreed with the present study. In addition, the current study is in agreement with the study of Shaw et al.[22] in which LDL-c decreases significantly and the study of Tseng et al. [23] and Tokudome et al. [24] showed a significant decrease in TGs and a significant increase in HDL-c in combined aerobic and resistance exercise training compared to CG. HDL acts as a remover of bad cholesterol in the reverse transport of cholesterol [25]. In our study high adherence to exercise (98%) was found and this may be also the possible reason for the improvement of lipid profiles in the EG. So this study has valuable clinical significance for the participants of the study in improving their lipid profiles. Application of randomized controlled studies, higher adherence level of the participants in the exercise, provision of alternative approach research to treat HTN in Ethiopia for the first time are the strength of the study. Whereas the inclusion of only mild hypertensive patients in the study and exclusion of individuals out of the study area due to feasibility risks were the limitations of the study. The findings from the current study suggest that physicians, fitness instructors, and physical education teachers should encourage hypertensive patients to engage in combined aerobic and resistance exercise training program on a regular basis.

Conclusion

Combined aerobic and resistance exercise training significantly reduced TC, LDL-c, TGs and significantly increased HDL-c levels in hypertensive patients. Public awareness promotion should be designed and implemented by concerned bodies for hypertensive patients to realize the importance of combined exercise trainings and thereby increases their adherence to exercise programs.

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Conflict of Interest: Nil.

Source of Funding: The study supported by Mekelle University.

Ethical Clearance: The study was approved by Health Research Ethics Review Committee of Health Sciences College of Mekelle University with Ref. ERC07752016. Before continuing the study written informed consent was obtained from all study participants after reading and explaining of information sheets in their local language (Amharic) regarding procedures, confidentiality and risks of the study. Further, the privacy of private data was strictly preserved.

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Ego State Therapy (EST) and Systemic Desensitization (SD) to Reduce School Refusal among Senior High School Students

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Abstract

This paper compared Ego State Theraphy (EST), Systematic Desensitization (SD), and the combination of both treatments to reduce school refusal among high school students. It employed experimental approach with pretest-posttest control group design. It used Scale Revised-Child (SRS-RC). It took 40 high school students in Surabaya. The data were analyzed one-path anava. It concludes that first, school refusal declining in the subjects of experimental group which underwent EST, SD, and SDEST are significantly different from control group. Second, the three strategies tested in this research are more effective in reducing the symtomps of school refusal. Third, subjects in experiment group with SDEST strategy have sustained a decline in school refusal score greater than subjects in experiment groups which underwent single strategy

Keywords: *Ego state therapy, desensitisazation, systematic, school refusal.*

Introduction

In recent decades, school refusal has attracted much interest in international research(1). Gasparda, et al.(2) state that in modern society, the number of adolescents who refuse to go to school continues to increase. Unsuccessful school refusal lead to a great negative impact, not only on cognitive development but also on the physical and psychosocial development of children(2). Therefore, school refusal needs to be managed immediately and appropriately as soon as possible(3).If a student undergoes a prolonged school refusal his/her academic, personal, or social life will be disrupted.

School refusal is an emotional problem manifested by a child's unwillingness to attend school by showing a physical symptom, caused by anxiety separated from the closest person, due to a negative experience at school or having problems in the family. Children who undergo school refusal feel uncomfortable because of anxiety about something related to school so they can lose the ability to master developmental tasks at various stages during their development(1).

According to Kearney(4), School refusal behavior can be seen from one or a combination of the following characteristics: a) absences from school, refuses to go to school, does not want to go to school, b) attend school but then leave it before school time is dismissed, c) Present at school but exhibit unexpected behavior, from isolation behavior, do not want to be separated from its attachment figure, aggressive, uncooperative to temper tantrum, d) presents physical complaints and other complaints (excluding physical complaints) in order to avoid him or herself to go to school.

Some children undergo school refusal due to negative experience occured in school, while some of them is due to family issues. Also, there is a high probability of children undergo school refusal because a negative experience they obtained in school such as scorning, teasing, or bullying by their friends. Besides, some of them might feel ashamed because they are visually unattractive, overweight, too skinny, prone to fail in school.

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School refusal has been convincingly experienced by public and private high school students in surabaya city, this data is reinforced by previous research indicating that students who are school refusal of the country ranged between 2.5% [5]. The school refusal condition in Surabaya city is higher than the international refusal condition that is 2.4% [6]. The higher prevalence of school refusal compared internationally, suggests that school refusal is a serious problem and requires immediate and comprehensive treatment.

Meanwhile, the survey also indicate that the highest cause of school refusal of students is 50% of which occurred due to traumatic experienced by schools and teachers. It is in line with King[7], who found that on psychological examination, many of the children who experienced school refusal had a phobic disorder. It also found that among the causes of school refusal, the most difficult to overcome, according to the school counselors, school refusal is caused by school phobia and traumatic events experienced.

Numerous counseling interventions is available to overcome school refusal problems (Ego State therapy (EST) and Systematic desensitization (SD)). Systematic Desensitization (SD) employs reciprocal inhibition principles, a fear-inducing stimulus paired with a response that block the emergence of feelings of fear. The child will gradually be confronted with a fear-inducing stimulus hierarchy while applying relaxation to make him/herself comfortable. Once the child is comfortable and the level of fear is reduced, he will be faced with a more difficult stimulus[8]. Erford[9]states that SD is a procedure in which clients repeatedly recall, imagine, or experience anxiety-generating events and then use a relaxation strategy to suppress the anxiety caused by the event. Meanwhile, EST is a method that focuses on the premise of personality that consists of separate parts called ego state or Mini Personality[10]. The purpose of ego state therapy is first, to allocate ego states where there is pain, trauma, anger or frustration, which is facilitated to be expressed, released and empowered. Second, it aims at facilitating the communication function among the ego state. Third, it aims at helping clients to recognize their ego state. Fourth, resolve conflicts within the client.

More specifically, this research also aims at combining Ego State therapy (EST) and Systematic desensitization (SD). Both EST and SD are combined to resolve a school refusal case which belongs to phobia due to traumatic experience underwent by students in school. The traumatic memories that a person experiences are stored within the subcortical brain region-the subconscious. According to Barabasz & Barabasz[11], when a person experiences trauma, memory associated with trauma events will stick in the brain in a non-verbal, unconscious and very-difficult-to-access section. This area can not be reached by cognitive-behavioral counseling, but can only be reached by EST. The combination of EST and SD is intended to help students who experience school refusal comprehensively. On the one hand, students need to be assisted in overcoming trauma experienced by using EST, while EST and SD are used to overcome fear of subject teachers both imaginary and in vivo. In essence, the combination of EST and SD, or SDEST (Systematic Desensitization and Ego State therapy) as an intervention strategy that seeks to constructively construct traumatic memories and increase the courage of the counselee to face current and future realities .

Method

It was an experimental research with *pretest-posttest control group design.* Senior High School Students in Surabaya undergoing school refusal were taken as research subject. It obtained 40 students as research subject and divided into for groups which consisted of 10 students in each group. One group of student was given an Ego State Therapy (EST), one group of student was given Systematic Desensitization (SD), one group of student was given combination of Systematic Desensitization (SD) and Ego State Therapy (EST)= SDEST, and one group of student was a control group with no treatment. This research utilized school refusal Revised-Child (SRS-RC) developed by Haight, et.all.[12].

The experiment was conducted by ten school counselors who obtained a training regarding EST, SD, and SDEST. The experiment was conducted six sessions which each sessions took 60 minutes. In addition, it was conducted individually and privately in counseling room. The data obtained during experiment were then analyzed by using descriptive statistic analysis and one-way analysis of variance (ANOVA).

Results

The analysis results of one-way analysis of variance (ANOVA) regarding the obtained score from group with EST treatment, group with SD treatment, group SDEST treatment, and control group are presented in the following Table.

Table 1: One-way Analysis of Variance Results

Source	JK	db	RK	F	R^2	P
Between A	23.9121	3	7.970699	32, 149	0.728	0.000
within	8, 925402	36	247, 928	--	--	--
Total	32, 837500	39	--	--	--	--

The score of F between A = 32,149 db = 3. 36 p = 0.000. Results of significance test indicate that the difference average of posttest score of school refusal scale among groups with EST, SD, SDEST, and control group are significant. The average score of group which treated by SD (A1) is 30.100, group which treated by EST (A2) is 25.300, group which treated by SDEST is 10.000, while the control group (A4) obtained 75.600.

According to the average score of posttest in school refusal scale among the four groups examined, the differences are significant. It further affirms that the proposed hypothesis in this research is accepted.

The following tables present the average score of each group and the results of T test among groups after giving treatment.

Table 2: Variabel T-test between groups

Groups	X (Posttest)	p
A1(SD) – A2 (EST)	0.682	0.507
A1(SD) – A3 (SDEST)	2.854	0.007
A1 (SD)– A4 (Control)	-6.462	0.000
A2 (EST)– A3 (SDEST)	2.173	0.034
A2 (EST)– A4 (Control)	-7.143	0.000
A3(SDEST) – A4 (Control)	-9.316	0.000

Based on t-test among treatment it can be seen that: the value of t A1-A2 = 0.682 db = 36 p = 0.253 for one tail. Significance test: the mean difference of the school refusal score between the groups treated with SD and EST was significant. So it can be concluded that between groups treated with SD and EST obtained a similar outcome in decreasing the school refusal. The value of t A1-A3 = 2.854 db = 36 p = 0.0035 for one tail. Significance test: difference of mean score of school refusal between group treated by SD (A1) and group that got combination treatment of Ego State therapy and Systematic desensitization (SDEST) (A3) is significant. So it can be concluded that the school refusal of group with SDEST was highly decreased compare to a group treated by SD.The value of t A1-A4 = -6.462 db = 36 p = 0.000 for one tail. The significance test of mean difference of school refusal between groups with Systematic desensitization (SD) and control group is significant. The value of t A2-A3 = 2.173 db = 36 p = 0.017 is for one tail. The significance test of mean difference of school refusal between groups with EST and the combination of Ego State therapy and Systematic desensitization (SDEST) is significant.

Based on the t test above, it can be summarized that the group treated with Ego State therapy and Systematic desensitization (SDEST) combination counseling strategies have a greater decrease in school refusal level compared to the group receiving Ego State therapy and Systematic desensitization (SD) separatedly.

Thus the hypothesis which states that "the combination of Ego State therapy and Systematic desensitization (SDEST) is more effective than separated treatment to handle school refusal among students ". To report the results of descriptive analysis, it was taken from school refusal score data, both the score before treatment and the score after treatment. The following is a graph showing refusal school scores of research subjects at the size before and after treatment

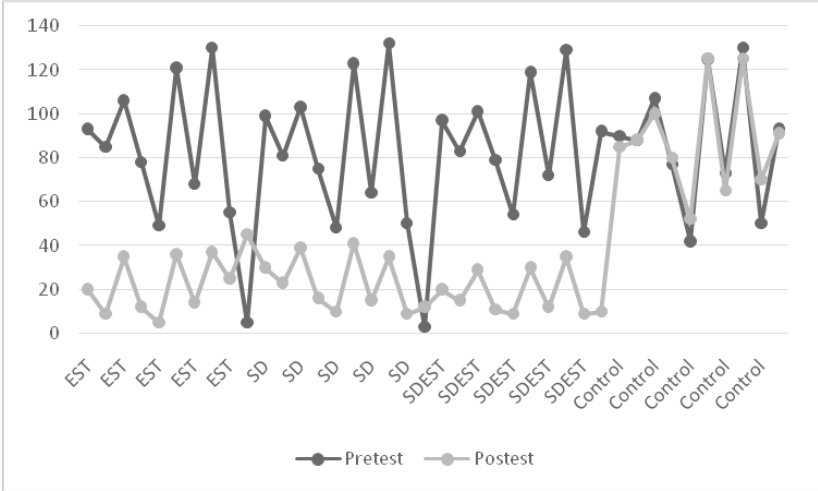

Figure 1. Scores school refusal pre and posttreatment

According to the graphic above, the counselees' score who obtained treatment (EST, SD, SDEST) before and after undergoing treatment is decreasing. On the other hand, within control group, some subjects' score decreased, while some others not and even increased.

Discussion

According to the analysis results of the obtained data from the four groups after undergoing treatment, it is found that the score of each group (EST, SD, SDEST, and control group) is different significantly. Additionally, EST, SD, and SDEST are confirmed successfully in reducing subjects' school refusal. This promote the findings revealed by Lee and Miltenberger [(13)], and Kearney and Silverman[(14)]. These initial research affirms that SD is an effective strategy to manage school refusal within children, particularly because of phobia in school. Also, it affirms that EST is able to manage effectively traumatic syndrome such as post traumatic stress disorder and acute stress disorder [(11)]. In addition, ego state therapy is effective to handle individual's trauma [(15)].

The decreasing of school refusal score average in experiment classes indicates that the treatments tested, EST, SD, and combination of Ego State Therapy (EST) and Systemic Desensitization (SDEST) in this study were successful in managing school refusal of the children.

The results of subsequent analysis indicate that the group treated with combination of EST and SD (SDEST) experienced a greated decreasing of school refusal compare with single treatment of both EST and SD. Both groups treated with single EST and SD experienced similar results in school refusal score. Hence, hypothesis stating that "Combined treatment of EST and SD is more effective than single treatment in managing students' school refusal" is accepted.

Among the three strategies tested in this research (EST, SD, SDEST), SDEST or the combination of both EST and SD is the most effective strategy which is able to manage significanctly students' school refusal. SDEST is effective to manage significantly school refusal because it is able to comperehensively construct past memories in a positive approach and promote counselees' courage in facing recent and upcoming events in an adaptive way.

In previous research, some scholars and researchers have attempted to combine systemic desensitization (SD) with other strategies. Iglesias and Iglesias [(16)] conducted a research by combining hypnosis and SD to reduce specific phobia, Ventis[(17)] combine SD and humour to reduce anxiety. While Poorgholami and Fatehi[(18)] examined combination of systemic desensitization and study-skills training to reduce students' anxiety during test. Also, Rajiah[(19)] combined psychoeducation strategy and systemic desensitization to reduce students' anxiety during test.

The combination done in this research was following the combination of the previous research, a combination done by Iglesias and Iglesias[(16)]. They have combined hypnosis and systemic desensitization. The combination model is in the form of suggestion which is part of

hypnosis given to the counselee during hierarchical scene. Ventis[17] has combined systemic desensitization and humour. Combination model arranged by Ventis is identical by Iglesias and Iglesias who merge humour within systematic desensitization.

Conclusion

The research affirm that the decline of school refusal of experimental are significantly different from control group. Second, the three strategies tested in this research (EST, SD, and SDEST) are more capable in reducing the symtomps of school refusal. Third, subjects in experiment group with SDEST strategy have sustained a decline in school refusal score greater than subjects in experiment groups which underwent single strategy. This research further implies that SDEST is the most feasible and remarkably effective strategy in managing school refusal. Fourth, SDEST offers numerous benefits to the counselee and provides less obstacles during the process.

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Ethical Clearance: We/I, the undersigned researcher(s) have read the Malang State University's Guidelines for Ethical Review of Research Involving Humans and agree to abide by them in the conduct of this research. It is understood that this includes the reporting and monitoring roles associated with the approval by Indonesian Guidance and Counseling Association.

Conflict of Interest: The research being reported in this publication was supported by Malang State University. The author(s) of this publication, has equity ownership in, which is developing products related to the research being reported. The terms of this arrangement have been reviewed and approved by Malang State University in accordance with its policy on objectivity in research.

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Implant Materials Used for Orbital Floor Reconstruction

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Abstract

Purpose: To review different available implant materials used for orbital floor reconstruction regarding their indications, advantages and disadvantages.

Summary: Review of literature revealed the presence of a wide variety of implant options for repair of orbital floor defects. They can be broadly classified into biological materials, metals and polymers which are further divided into resorbables and non resorbables. The choice could be based on an algorithm for the defect size, the anatomical location, or the remaining structural support. Small defects may heal solely by the formation of scar tissue, whereas larger defects, especially those associated with enophthalmos, need material of a sufficient strength to support the orbital contents.

Keywords: *Blow-out fractures, Titanium, resorbable polymers.*

Introduction

Fractures of the orbit are seen in many patients who have blunt trauma to the face and skull. The prominent position of the orbit in the craniofacial skeleton predisposes this region to injury. [1]

Blow-out fracture is a special type of fracture of the orbital floor. Rene Le Fort concluded that blow-out fractures occurred through force transmission from the more rigid infraorbital rim to the relatively weak orbital floor, known as the buckling theory. [2] This theory was challenged by Pfeiffer in 1948, who observed a case series of globe-directed trauma resulting in blowout fractures, leading him to propose the hydraulic theory, which states that hydraulic pressure from the globe is transmitted to the bony orbit resulting in fracture of the thin orbital floor.[3]

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In the repair of orbital fractures, the value of an implant is to regain function and aesthetic appearance by repairing the traumatic defect and bringing the globe into its correct position. In addition to the timing and method of reconstruction, a third essential factor in orbital fracture surgery is the choice of reconstruction material. [4]

Advances in biotechnology continue to introduce new implant materials for reconstruction of orbital floor fractures. Which material is best fit for orbital floor reconstruction has been a controversial issue. [5]

Characteristics of an ideal orbital reconstruction material [6]

1. **Stability and fixation:** The implant should be strong enough to support the orbital content and related forces, do not deform (sagging of material into maxillary sinus) under load and can be fixed to surrounding structures
2. **Contouring and handling:** Restores adequate volume to treat enophthalmos and diplopia, easy to shape to fit the orbital defect and regional anatomy and has smooth surface.
3. **Biological behavior:** Ideal implant is biocompatible with no infection, migration, foreign body reaction,

non-allergenic and non-carcinogenic. It should be osteosynthetic and shows high tissue incorporation but easily dissectable in implant removal during secondary reconstruction

4. **Drainage:** Spaces within the implant should be present to allow drainage of orbital fluids
5. **Donor site morbidity:** The implant should not increase surgical complication rate or donor site morbidity (pain, swelling, etc.)
6. **Radiopacity:** The implant should be radiopaque to enable radiographic evaluation without artifacts.
7. **Availability and cost-effectiveness:** Ideal implant should be readily available in sufficient quantities and acceptable costs

Types of materials used for orbital reconstruction:[6]

1. **Biological materials:**

- *Autografts/autogenous materials:*
  i. Autologous bone: calvarium, iliac crest, rib, mandibular symphysis, maxillary sinus wall
  ii. Autologous cartilage: nasal septum or concha, auricle, rib
  iii. Autologous fascia: Tensor fascia lata, temporal fascia
  iv. Autologous periosteum
- *Allografts*: Lyophilized dura mater; demineralized human bone, lyophilized cartilage, irradiated fascia lata.
- *Xenografts and animal-derived materials:* porcine sclera, porcine skin gelatin/Gelfilm, bovine bone or sclera
- *Biological ceramics (inorganic, non-metallic):* Porous hydroxyapatite (HA) and other calcium phosphates.

2. **Metals:** Titanium, Cobalt alloys
3. **Polymers (plastics):**

- *Non-porous non-resorbable (permanent) implants*: Silicone, nylon (SupraFOIL; Supramid), polytetrafluoroethylene (PTFE; Teflon, Gore-Tex), hydrogels, PEEK (poly ether ether ketone)
- *Non-porous resorbable implants:* Hyaluronate/ carboxymethylcellulose (HA/CMC; Seprafilm).
- *Porous non-resorbable implants*:

Porous polyethylene (PE; Medpor)

- *Porous resorbable (absorbable) implants:* Poly (lactic acid) (PLA), poly (glycolic acid) (PGA), PLA/PGA implants Polydioxanone (PDS), polyglactin 910/PDS implants (Ethisorb).

4. **Composites:**

HA-reinforced high density composite

Titanium/PE composite implant (Medpor Titan)

HA/PLA/polycaprolactone (PCL) sheet

Bone morphogenetic protein-loaded gelatin hydrogel

Advantages and disadvantages of currently available reconstruction materials:

- **Biological materials:** Biological materials are defined as grafts harvested from the same or another human or animal and include autografts, allo-grafts, and xenografts. [6]

Since the 18th century, autologous bone has been the 'gold standard' biomaterial for the reconstruction of bony defects in the craniofacial area.[7] Autologous bone grafts are used in orbital surgery because of their strength, rigidity, vascularization potential, and incorporation into the orbital tissues with minimal acute and chronic immune reactivity (i.e. infection, extrusion, collagenous capsule formation, and ocular tethering).[8] Donor site morbidity remains a general drawback for autologous bone harvesting. [6]

Allografts (homografts) are transplanted tissues (e.g. lyophilized dura mater or banked (demineralized) bone) from another human being. Their advantages include a decreased surgical time, preoperative customizability, absence of donor site morbidity, and abundant availability of banked bone. [4] Lyophilized dura (Lyodura) was a standard in the past for the reconstruction of smaller orbital defects because of its strength and absence of tissue reactions. [9] However, it became controversial following a case of Creutzfeldt–Jakob prion disease in a patient who received dura originating from a cadaver.[10] Consequent to this report, lyophilized dura sterilization was no longer performed with gamma irradiation but with sodium hydroxide. [11] The disadvantages of allografts include a resorption rate substantially higher than that of autologous tissue,[8] the

need for immunosuppressive pharmacotherapy, and the risk of viral transmission, such as hepatitis C virus and HIV.[12]

- **Metals**

Titanium has been used extensively in craniofacial surgery and dentistry in the form of implants, plates, and screws. [13] With its high biocompatibility and physico-mechanical properties, it could be an ideal implant for covering large anatomical defects (categories III–V) and globe malposition if implant-stabilizing surrounding bone or a distal landmark (a 'bony ledge') is absent.[14]

Titanium mesh is strong, rigidly fixable, widely available, and is subject to osseointegration with minimal foreign body reaction.[15] However, titanium is costly and may have irregular edges if not cut properly, which may impinge soft tissue. Furthermore, fibrous tissue will incorporate the mesh-holes, which can make implant replacement technically complex.[15] Late unwanted effects such as infection, corrosion, and toxic metal ion release have been reported with the use of titanium implants.[13] One Randomized Control Trial (RCT) has evaluated the effects of titanium implants as compared to perforated (PDS) foil for small orbital floor fracture reconstruction, and found no significant differences in the clinical outcomes.[16] A pilot study without controls used a low-profile 0.25-mm titanium plate in large defects (categories II and III) and found successful clinical outcomes without complications in 93% of the cases; at the 6-month follow-up, no functional or aesthetic concerns were observed. [14]

- **Polymers:** Polymers (or plastics) are large molecules comprising multiple repeated subunits and can be categorized into absorbable and non-absorbable (permanent) types. [6]

Non-absorbable permanent polymer implants: Porous ultra-high density polyethylene **(PE; Medpor™)** sheets of various sizes and thicknesses (0.4–1.5 mm) have been used widely to cover smaller floor defects since the 1990s. This widespread use is a product of the ability to easily cut the sheets into various shapes and the ability of orbital tissue to move freely over the smooth surface. Connective tissue and vascular components grow into the pores with minimal foreign body reaction. [17] In a prospective cohort study of floor reconstructions, PE sheets showed satisfactory surgical outcomes and infection rates similar to autografts.[18]

Polytetrafluoroethylene (PTFE; Teflon) is biologically and chemically inert, non-antigenic with minimal foreign body reaction, sterilizable, and easily mouldable. However, this polymer has not yet been subject to comparative clinical studies.[6]

Relatively new in orbital floor repair is the use of nylon foil, a non-porous poly-amide. Nylon foil has provided favourable results in preliminary non-comparative studies.[19]

Resorbable Osteosynthesis implants: Although the performance and biocompatibility of metallic and titanium fixation in osteosynthesis has been reported as satisfactory, a number of disadvantages have been associated with its use, including stress shielding of bone or osteopenia[20], impairment in imaging evaluation[21] and its restricted use in certain specific circumstances such as pediatric craniofacial surgery.[22]

Resorbable materials have been used widely for over 30 years in many fields of surgical practice, [23] and are of interest because of their more predictable absorption rates than biological grafts, as well as their high level of customizability and control. [24]

Chemistry and mechanism of action: Bioresorbable polymers are mainly high-molecular-weight aliphatic polyesters with repeating units of α-hydroxy acid (HOCHR-COOH) derivatives manufactured by ring-opening polymerization. The absorption of these polymers begins with depolymerization through the hydrolysis of their ester bonds and subsequent metabolism, probably by macrophages, in the citric acid cycle into water and carbon dioxide. [25]

The first clinically used bioresorbable polymer was polyglycolic acid (PGA), a highly crystalline and high-molecular weight molecule with limited clinical use for osteosynthesis because of its susceptibility to rapid degradation. Approximately 4–7 weeks after implantation, a duration which is insufficient to allow complete bone healing, PGA loses its mechanical strength in vivo. In addition, the side effects of PGA have been detected during its clinical use; these are due to the difficulty in clearing the accumulated acid degradation products. These negative effects have resulted in the minimal use of pure PGA in osteosynthesis.[26]

Polylactic acid (PLA) is another high-molecular-weight bioresorbable polymer; its optically active carbon in lactic acid generates 2

stereoisomeric forms, namely poly- L -lactide (PLLA) and poly- D -lactide (PDLA). Since the early 1990s, PLLA has been used as an osteosynthesis material. [27] Due to its crystallinity and hydrophobicity, PLLA is fairly resistant to hydrolysis, and thus bioresorption with complete loss of its strength in vitro does not occur within the first 2 years of implantation. PDLA, on the other hand, has a lower crystallinity and is less resistant to hydrolysis. Because of its slower degradation rate, PDLA has been reported to be highly biocompatible, although crystalline particles resistant to degradation may elicit some inflammatory response. [27]

By copolymerization of different derivatives of α-hydroxy acids, a variety of different mechanical qualities and degradation rates can be achieved. Copolymers of L -, D -lactides, for example, SR-P(L/DL)LA 70/30, a copolymer composed of 70% PLLA and 30% PDLA, loses all its strength in vitro after 48 weeks of implantation.[28] Copolymers of L -lactide and glycolide (PLGA) have been extensively used owing to the wide range of physiochemical properties of the components.[29]

Advantages and disadvantages of resorbable implants: The main advantages are easy handling and contourability, smooth surface and smooth edge, do not necessarily require rigid fixation, ideal for pediatric fractures, thin and can be applied in multiple layers in larger orbital volume displacement and without late implant related complications as infection, migration and extrusion. [6]

On the other hand, these materials can be radiolucent on postoperative imaging. [6]Some authors believed it may not provide enough support to orbital contents in large fractures and demonstrated an increase in orbital volume as a late complication. [30]

In a RCT, the administration of an absorbable copolymer of PLA and PGA had functional and aesthetic outcomes and complications similar to auricular cartilage implants in orbital blowout fractures with or without medial wall involvement. [31] In addition, PLA 70/30 plates were studied in a controlled trial and showed similar surgical outcomes and complications as compared to autografts in category II and III floor defects, without MRI evidence of foreign body reaction.[32]

Discussion

Depending characteristics of the different materials of orbital implants, it was feasible to postulate clinical recommendations for materials in specific cases.

Treatment algorithm for orbital wall fractures[6]:

1. Small-sized, low-complexity defects (class I): Most materials are suitable; biological behaviour is most important and resorbables may be used in these cases.
2. Medium-sized, medium-complexity defects (class II): Apart from the bio-logical behaviour of an implant, the experience of the surgeon with specific types of orbital implants will benefit the outcome. Various materials can be used, from autologous materials to alloplasts.
3. Large-sized, high-complexity defects (classes III–VI): Stability and contour become more significant and pre-bent or patient-specific titanium mesh is the preferred reconstruction material.

Conclusion

The debate on the clinical recommendations for orbital reconstruction material will likely continue because of the absence of RCTs and best practice clinical studies. Controversy exists regarding the best material features, which can be defined broadly by whether the implant is: (1) autogenous or allogenic, (2) non-resorbable or resorbable material and (3) malleable or preformed anatomical plates.

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Expression of Amylin and Preptinin Iraqi Patients with Type 2 Diabetes Mellitus

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Abstract

Diabetes mellitus is one of the most worldwide spread chronic diseases, and its complications are very serious if it is untreated. Type-2 diabetes mellitus (T2DM) is reported to be caused by obesity and sedentary life style. DM plays a role in accelerating the hardening and narrowing of the arteries. Preptin and amylin are pancreatic hormones which participate in glucose homeostasis. In T2DM patientsamylin peptids can be toxic to β-cells of pancreas due to Amyloid deposits within these cells, supporting the idea that islet amyloid might have an important role in the pathogenesis of T2DM.preptin is a peptide hormone that is secreted with insulin and amylin from the pancreatic β-cells. The study planned to investigate the relationship between serum amyline and preptinlevelsin patients with T2DM compared to healthy controls and to study their associations together (preptin and amylin) with serum levels of insulin and HOMA-IR. Sixty-four (64) patients were recruited from the Endocrine Outpatient clinic in Al-Imamain Al-Kadhimain city hospital from March of 2018 to May of 2018. Fasting serum samples were obtained on enrolment. (mean age, (61.73± 8.05) years;mean duration of diabetes, (8.77±2.66) years; mean HbA1c, (8.1 ± 1.7) with T2DM and body mass index (BMI) > 25.1 kg/m^2 underwent examination. Age, sex and (BMI) matched with thirty eight(38) healthy controls were also in ruled,Serum preptin and amylin levels were measured by ELISA technique. There was statistically significant difference between patients and controls serum amylin (p=0.023) and preptin (p=0.01).Patients with T2DM had significantly higher blood glucose (p=0.0001), HbA1c (p=0.0001), insulin (p=0.0001), and homeostatic model assessment of insulin resistance (HOMA-IR) (p=0.001)compared to healthy control,while total cholesterol was positively related (p=0.111) triglyceride, low-density lipoprotein cholesterol values were (p<0.001 for each), and significantly lower high-density lipoprotein cholesterol levels compared with the control group (p<0.0001). The preptin level demonstrated a significant positive association with insulin and HOMA-IR compared with healthy control. (for healthy control group: r=0.381,p=0.146, r=0.133,p=0.438) respectively; for T2DM group: (r=0.411,p=0.02, r=0.332,p=0.003), The amylin level also showed a significant positive correlation with insulin and HOMA-IR compared with healthy control. (for healthy control group: r= 0.188,p=0.309, r= -0.039,p=0.911) respectively; for T2DM group: (r=0.279,p=0.002, r=0.291,p=0.003),Conclusions: There were significant differences between healthy control and patients with T2DM concerning amylin and preptin levels. Serum Amylin and preptin increase in association with insulin in diabetic conditions. The present study suggests a potential role of amyline and preptin in the pathogenesis of T2DM.

Keywords: *Amylin, preptin, type 2 Diabetes Mellitus.*

Introduction

Diabetes mellitus (DM) is a metabolic disorder characterized by chronic hyperglycaemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both[(1)]. Typical presentation of Diabetes mellitus includes symptoms like thirst, polyuria, blurring of vision, and weight loss[(1)].

T2DM results from defect in insulin action in hepatic and peripheral tissues, especially muscle tissues and adipocytes[(2)]. The specific etiologic factors are not known but genetic input is much stronger inT2DM than type 1 diabetes mellitus(T1DM)[(2)]. Human islet amyloid polypeptide (hIAPP) which named as amylin, 37 amino acid, that is co-secreted with insulin from pancreatic islet β cells. This peptide when accumulates and aggregates

forms fibrils, Amyloid deposits is associated with β cells degeneration which considered as a hallmark of non-insulin dependent diabetes mellitus (NIDDM)[3]. The prevalence of diabetes for all age-groups worldwide was estimated to be 2.8% in 2000 and expected to be 4.4% in 2030 [4]. The total number of people with diabetes is projected to rise from 171 million in 2000 to 366 million in 2030. According to International Diabetes Federation data, there were some 425 million patients with diabetes worldwide in 2017, and this number is estimated to reach 629 million by 2045 [5,6,7]. Amylin is produced via gene expression on chromosome 12. It is transcribed as an 89-aminoacid prepolypeptide, which is cleaved to form the mature peptide in the β cells of the pancreas, where it is stored along with insulin and C-peptide in the same granules [8].

Amylin, which is co-secreted with insulin, regulates post-prandial glucose levels in part by inhibiting gastric emptying and suppressing glucagon release while not affecting glucose uptake[9]. Amylin has been shown to mirror insulin secretion in healthy subjects[10], obese subjects, prediabetes (subjects with impaired glucose tolerance)[11,12], and patients with T2DM[10]. These findings suggest an active role for plasma amylin levels in modulating glucose metabolism[13].

As an endocrine peptide, preptin is thought to activate the insulinlike growth factor receptor 2 (IGF2R), and as a result, induces calcium-dependent insulin secretion in association with protein C and phospholipase C when the glucose concentration is high[14]. In addition, preptin has insulin-like effects on bone metabolism, such as boosting cellular differentiation and affecting the functions of osteoblasts and osteoclasts[15]. Preptin is a 34-amino acid peptide hormone co-secreted from the βcells of pancreas along with insulin, amylin, and pancreastatin[16, 17].Females have higher preptin levels than males [18]. Preptin is believed to be a pphysiological enhancer of insulin secretion induced by glucose. There isa strong correlation between obesity, hyper-insulinemia and insulin resistance, and these associations get stronger with iincreasing bodyweight[19].Therefore, the relationship between BMI and preptin level would be a worth investigation. Hence, this study was carried out to evaluate amylin and preptinin patients with T2DM.

Subjects, Material and Method

Subjects: This study comprised sixty four consecutive patients of T2DM (26male and 38 female) and 38 healthy control (18 male and 20 female) were recruited from the Endocrine outpatient clinic in Al-Imamain Al-Kadhimain city hospital from March 2018 to May 2018.

All of the patients were asked to provide socio-demographic data, medical history, and family history. Other questions included were: theduration of disease, age of onset of the disease, any treatment taken.

Inclusion criteria: Patients who are suffering and diagnosed as T2DM patients.

Exclusion Criteria: T1DM patients., Pregnant women,Presence of other autoimmune disease like Hashimoto's thyroiditis, SLE, patients with liver disease, renal disease, recent history of cardiovascular disorder, hypertension, neurological disease, or, obese subjects with history of acute or chronic infections, any other chronic diseases, under cortisol treatment or suffering from any autoimmune disease, were excluded from the study.

Blood Sampling: Blood samples (7 ml) were collected from T2DM patients diagnosed according to the WHO protocol, and control subjects in serum separatorvacutainers (BD Vacutainer Systems, Plymouth, UK).Sera were separated and immediately stored at − 20° Cuntil analysis.

Serum Amylin and preptin: The quantitative determination of Amylinlevels and preptin were conducted by ELISA technique, using acommercial available kit,(human Amylin ELISA kit Catalog No. MBS72142 Mybiosource.com) and (human Preptin ELISA kit Catalog No. MBS764034 Mybiosource.com), respectively.

Statistical Analysis: All data were coded and entered using the program statistical package for social sciences (SPSS) version 25 under windows XP. Descriptive data was summarized using mean, standard deviation (SD), $P< 0.05$ were considered statistically significant.

Results

Serum levels of Amylin and preptin were estimated in 64 patients with T2DM, compared with 38 healthy control,age and sex matched. As expected, the patients with T2DM had significantly higher level of Amylin levels than the healthy controls($P=0.023$), as shown in table (1) and Figure(1).

The concentrations of preptin level,are presented in Table (1) are significantly higher in T2DM patients as compared with normal subjects (p=0.01).As shown in figure(2), The mean levels of amylin and preptin in normal healthy subjects and T2DM pateints was depicted in Table 1.

Table:(1): The Anthropometric and biochemical variables between the studied groups.

Parameters	Healthy Control Mean ± SD	Type 2 DM Mean ± SD	P-value
NO.	38	64	.....
Age (Years)	58.3 ± 9.1	61.73± 8.05	0.0001
BMI	26.5 ± 3.2	29.2 ± 4.2	0.411
FPG (mg/dL)	78.8± 8.1	188.3± 38.1	0.0001
HBA1c (%)	4.1 ± 1.3	8.1 ± 1.7	0.0001
Insulin (µiU/L)	6.67 ± 4.76	4.33 ± 2.53	0.0001
HOMA-IR	1.21 ± 0.16	1.77± 0.38	0.001
TotalCholesterol(mg/dL)	165.7 ± 22.3	191.7 ± 26.3	0.111
Triglyceride (mg/dl)	96.8± 29.3	187.6 ± 63.6	0.0001
HDL-C (mg/dL)	44.3 ± 4.1	34.5 ± 2.8	0.0001
LDL-C (mg/dL)	105.4± 26.3	181.4 ± 41.8	0.293
Amylin (pg/ml)	133.46±68.47	244±73.74	0.023
Preptin (pg/ml)	383.11±18.47	546.68±19.62	0.01

Values are Mean ± SD,.BMI: body mass index HOMA-IR: homeostatic model assessment-insulin resistance,FPG:fastingplasmasugar,HBA1c:hemoglobin A1C, HDL-C: high-density lipoprotein-cholesterol, LDL-C: low-density lipoprotein-cholesterol, $P < 0.05$ is considered statistically significant

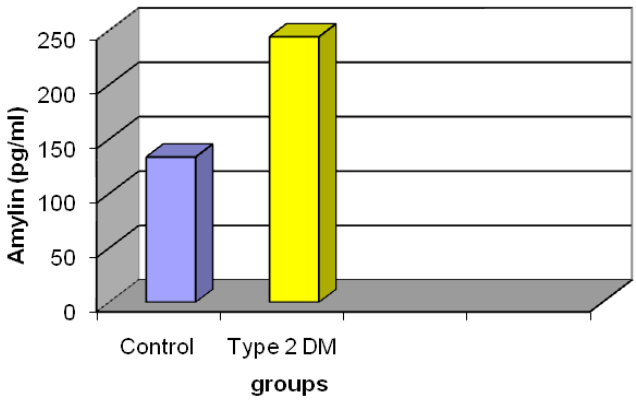

Figure (1): Mean levels of Amylin in patients with Type 2 DM compared to healthy controls.

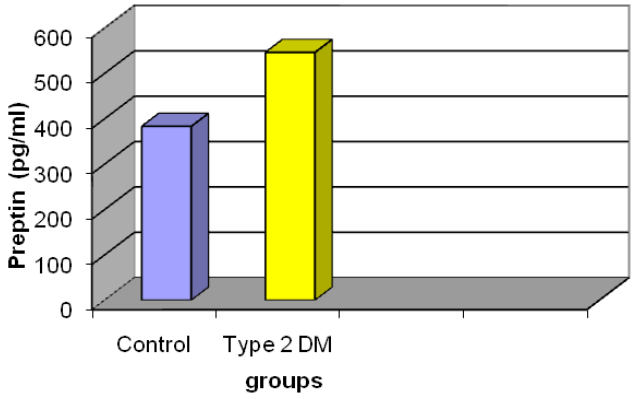

Figure (2): Mean levels of Preptinin T2DM patients compared to healthy controls

The amylin level demonstrated a significant positive correlation with insulin and HOMA-IR compared with healthy control (r=0.279,P=0.002), (r=0.291,P=0.003). Also preptin level showed a significant positive correlation with insulin and HOMA-IR compared with healthy control. (r=0.411,P= 0.02), (r=0.332,P= 0.003).

Discussion

In T2DM,the levels of amylin are raised in parallel with the increased demand for insulin, and this is thought to induce concentration-dependent amylin aggregation[20]. Islet amyloid formation is associated with reduced β-cell mass [21] and human

amylin 'oligomers' (small, soluble aggregates) are toxic to cultured islet cells[22] suggesting that they could contribute to progressive islet β-cell failure. Amylin oligomers can disrupt membranes[23] and inflict oxidative damage to cells[24]. In the present study amylin was measured and compared in type 2 DM and control, there was significant statistical difference between type 2 DM and control group where the p-value was 0.023. Researchers mentioned that islet amyloid deposits are found in >90% of T2DM patientsat autopsy[25], and action[26]. Amylin has been. However,the mechanisms and the precise role of amylin in the pathophysiology of T2DM remain unclear.

In the present study The concentrations of preptin level significantly higher in T2DM patients as compared with normal subjects (p=0.01), as illustrated in Table (1). These results agree with other results done by Yang et al.[27] who found higher levels of preptin in T2DM patients compared with control group. Higher preptin levels have also been reported in studies of patients with gestational DM and polycystic ovary syndrome [28-30].

Preptin is a physiological enhancer of insulin secretion induced by glucose. Recent studies have revealed that there is a potential association between preptin and insulin resistance in humans [31]. About diabetes mellitus, this association was also significant and this is confirmed by literature where it was shown that the concentration of preptin levels were higher in DM patients[32].

Statistical analysis revealed that Amylin significantly related to the variations seen in HOMA-IR in the present study, indicating a connection between amylin and insulin resistance in patients with T2DM.In the present study preptin level showed a significant positive relation with insulin and HOMA-IR compared with healthy control. These results consistent with other results that showed strong association between preptin levels and HOMA-IR in obese subjects as previously mentioned[33]. Similar to our research, the preptin level showed a positive correlation with insulin, HOMAIR,glucose, and HbA1c levels in a study conducted by Yang etal.[27]. Therefore, it is expected that a possible relation between amylin and preptin levels might exist. In the present study these two peptides (amylin and preptin) increase independently in T2DM patients; however, both indices demonstrated a positive correlation with insulin levels and HOMA-IR values.

Conclusion

Amylin and preptin may have an important role in the pathogenesis of T2DM, and ultimately in the degeneration and death of pancreatic islet cells. These findings provided a new rationale and opening up additional avenues of research into the etiology, pathogenesis and the treatment of T2DM. The findings of this investigation may provide significant data for in future research.

Conflict of Interest: None

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Ethical Clearance: Not required.

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Evaluate the Correlation Between Antioxidant Capacity and Interferon Γ Level with the Disease Activity of Sle Patients in Iraqi Woman

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Abstract

This study was aimed to assess total antioxidants capacity as well as interferon γ cytokine in female with Lupus Erythematosus and their relationship with disease activity. Fifty-two female SLE patients diagnosed and classified according to the American College of Rheumatology (ACR)criteria admitted to Department of Rheumatology at Baghdad and alyarmook teaching hospital. SLE patients were clinically evaluated and disease activity assessed using the SLE indicator and a particular focus on the onset, duration of the disease, and the body organs affected by the disease. Routine laboratory tests were performed for all patients. The levels of serum cytokines and antioxidant capacity were measured by enzyme linked immunosorbent assays (ELISA).In the case of total antioxidant capacity, the result showed that mean values were significantly lower in active lupus patients than inactive lupus and controls (2.050±0.276, 1.322±0.254, 1.286±0.133) respectively, and, the mean of values of **interferon γ cytokine** in active and inactive SLE patients were significantly higher than control group (83.275±15.612,71.335±14.948,32.049±7.519) respectively.

Keywords: *Systemic Lupus Erythematosus,Oxidative stress, Interferon (IFN), disease activity.*

Introduction

Systemic Lupus Erythematosus (SLE) is an inflammatory autoimmune disease that can involve nearly all human bodies, such as the kidneys, skin, cardiovascular system, joints, muscles, and nervous system [(1)]. The main cause of SLE is still unknown and more complex pathogenesis includes immunological, hormonal, hereditary and environmental variables and the disease is striking in females and affects predominantly females in reproductive age, the incidence differs in black girls between ethnic groups 1:250 and 1:4300 in white girls[(2,3).]

In SLE disease, autoantibody production, immune complex deposition and dysfunction of each T & B lymphocyte resulting in severe injury to various organs and connective tissue in huge populations worldwide[(4).]

In recent years, free radical damage and oxidative stress have been appeared to have a critical impact in obsessive procedures and clinical manifestations in SLE patients[(5)]. Free radicals and reactive oxygen species (ROS) generated interminably as a consequence of cell metabolic processes. The protection mechanism deactivates these free radicals by splitting the antioxidant chain reaction consisting of enzymes and multiple non-enzymatic antioxidants.

The main cause of oxidative stress is the imbalance between the production of reactive oxygen species (ROS) and the antioxidant defense mechanism[(6)]. The accumulated output of free radicals interferes with the redox status and can boost the expression of a broad variety of inflammatory molecules that can cause inflammation and tissue harm[(8)]. Several studies show that a risk factor for autoimmune diseases such as SLE[(7,9)] may be oxidative stress. Impaired antioxidant status in SLE patients ' saliva was also recorded [(10).]

Cytokines play an important role in the production, maturation as well as differentiation of immune system cells, cytokines cannot be systematically predicted in autoimmune SLE,These are far more complicated than the simplistic effects[(11)].

Interferon is water-soluble dimmer cytokine in the only type-II interferon member originally called the activating factor of macrophage..Two anti-parreliner blocking monomers form the biologically active INF-γ, which consists of six alpha helices composed of one nucleus and one fraction sequence extend in the C-terminal region.INF-γ is a typical type of cytokine that is secreted by Th1 cells and its expression profile is controlled by a number of IFN inducing factors, including IL-12,15,18 [12,13].It is initiated in the initial stages of the innate immune response and has been suggested to enhance the adaptive autoimmune response., It has been suggested to play the central role [14]. IFNs are a familyof three major types of proteins;type 1(IFN-α,β), type II IFN-γ and type III IFN-γ1, IFN-γ2, IFN-γ3,These three types are different in their main sequences of proteins, cognate receptors, chromosomal positions and therefore in the types of response cells. Interferon impacts a wide variety of biological responses, including viral and bacterial diseases, a variety of tumor impacts and cell regulation in each immune response[15,16].

The aim of this study was therefore to assess the levels of IFN-γ, antioxidant capacity and serological association between SLE patients and healthy control.

Patients and Method

Fifty-Two SLE female patients were enrolled, and their age range was 12 - 67 years . They were referred to the Rheumatology Department's Consultant Clinic (Teaching Hospital of Alyarmook and Teaching Hospital of Baghdad) during the period January – may 2018 for diagnosis and treatment. A control group of thirty six subjects were also included, and they were matched patients for gender and age where the age of patients and healthy individual range between 20 - 60 years.

Clinical Examination: Patients were subjected to complete history and clinical examination including skin, neurological and vascular examinations generallocomotors system, respiratory, and chest.

Disease Activity: Clinical disease activity was assessed with the SLEDAI on the day of serum sampling. Two groups of SLE patients based on disease activity were present: inactive SLE at SLEDAI<14 (n=32), active SLE at SLEDAI above 14 (n=20).Their healthy state was confirmed by both clinical and routine laboratory research.

Investigations: Investigations of each sample were donebycompletebloodpicture,erythrocytesedimentation rate, renal function tests, Complement 3, Complement 4, ANA, and Anti DNA doublestrandedantibody.

Estimation of IFN-γ and Antioxidant Capacity: Blood samples of the patient's and controls were centrifuged and the serum tested for interferon gamma (IFN-γ) and antioxidant concentrations. Sera were analyzedusingsandwichenzyme-linkedimmunosorbent assay (ELISA) according to the protocols of the manufacturer. IFN-γ assay by the ELISA kit from cusabio, Inc. ® ELISA. Catalog Number.CSB-E04577h. Assay range: 22.3-109.852 pg/ml. TOC assay by Sun Long Biotech Co., LTD, the Catalogue Number: SL2334Hu. Assay range: 0.971-2.571 pg/ml.

Statistical Analysis: Analysis of data was carried outusing the available statistical package of SPSS-25 (Statistical Packages for Social Sciences- version 25). The significance of differing means (quantitative data) has been tested using Student's-t-test to differentiate between two independent means or Paired-t-test for paired observation differences (or two dependent means), Or ANOVA test for distinction between more than two independent means. Measures the association closeness by correlation coefficient between two quantitative continuous variables. Kruskall Wallis one-way variance analysis (KW) test was used to compare the median for > 2 independent non-related samples. The P value was considered statistically significant less than 0.05.

Results

Patients Clinical Parameters: The active and inactive female SLE patients mean age was (32.95±12.72, 34.69±14.88) years, (Table I). In SLE patients, the level of ANA, Anti-dsDNA,WBC, ESR, urea and creatinine were higher than in control group. Hemoglobin, C3 and C4 levels in active SLE patients were significantly lower compared to inactive and healthy patients. (Table I).

Table I: Clinical Characteristics of Patients

Parameter	Active SLE	Inactive SLE	Healthy control	All	AxH	IxH	AxI
Age (Years)	32.95±12.72	34.69±14.88	31.17±10.65				
C3 (IU/L)	0.77±0.43 (0.27-1.55)	0.93±0.42 (0.20-1.66)	1.08±0.33 (0.51-1.71)	0.016*	0.004*	0.094	0.193
C4 (IU/L)	0.27±0.17 (0.02-0.59)	0.37±0.17 (0.083-0.65)	0.39±0.15 (0.16-0.60)	0.031*	0.011*	0.746	0.039*
Anti-dsDNA(IU/ml)	24.48±3.88 (16.1-33.0)	17.35±8.95 (6.481-36.90)	15.09±1.85 (12.1-17.80)	0.0001*	0.0001*	0.142	0.002*
ANA (IU/ml)	3.17±1.04 (1.32-4.9)	3.25±1.92 (0.212-6.921)	1.09±0.06 (1.0-1.20)	0.0001*	0.0001*	0.0001*	0.867
ESR (mm/hour)	48.70±19.00 (8-77)	39.94±17.65 (15-88)	7.47±3.91 (2-17)	0.0001*	0.0001*	0.0001*	0.097
WBC (x103)	8.68±3.11 (3.90-15.2)	7.61±2.95 (3.8-14.30)	6.33±1.39 (4.0-9.10)	0.003*	0.0001*	0.024*	0.216
Hemoglobin (g/dL)	10.64±3.43 (4.70-21.0)	11.20±1.94 (8.20-16.0)	14.16±1.58 (11.20-17.30)	0.0001*	0.0001*	0.0001*	0.449
Platelets (x103)	244.45±136.40 (100-515)	283.28±137.50 (89-520)	269.94±63.52 (161-364)	0.484	0.344	0.603	0.325
Urea (mg/100 ml)	50.20±18.23 (25.0-88.0)	41.84±14.56 (19.0-74.0)	28.33±9.01 (16.0-44.0)	0.0001*	0.0001*	0.0001*	0.074
Creatinine (umol/L)	1.48±0.73 (0.45-2.53)	1.03±0.34 (0.40-1.70)	1.00±0.27 (0.43-1.50)	0.0001*	0.001*	0.641	0.005*

*Significant difference between two independent means using Student-t-test or difference among three independent means using ANOVA test at 0.05 level.

IFN-γ Level Based on disease activity and SLE clinical parameter: As shown in table II Active SLE had higher levels of IFN-γ than inactive and healthy co□trol. The serum level of IFN-γ in active SLE patients ranged from 51.528-109.85 pg/ml with a mean of 83.27±15.61 pg/ml, while its level in the inactive SLE was 46.01-99.852 pg/ml with a mean of 71.34±14.95 pg/ml, whereas in control group ranged from 22.386-49.474 pg/ml with a mean of 32.05±7.52 pg/ml. (Table II.)

TOC Level Based on disease activity and SLE clinical parameter: TOC levels differed between three SLE groups,TOC was lower in active SLE than inactive and normal controls with the mean of (1.29±0.13, 1.32±0.25, 2.05±0.28 respectively)

This indicating that **TOC** level are associated with increased disease activity.

Table II: The Level of TOC and IFN-γ in Sera

	Active SLE	In Active SLE	Healthy Control	All	AxH	IxH	AxI
IFN-γ (pg/ml)	83.27±15.61 (51.528-109.85)	71.34±14.95 (46.01-99.852)	32.05±7.52 (22.386-49.474)	0.0001*	0.0001*	0.0001*	0.008*
TOC (pg/ml)	1.29±0.13 (1.017-1.443)	1.32±0.25 (0.971-1.788)	2.05±0.28 (1.625-2.571)	0.0001*	0.0001*	0.0001*	0.567

Discussion

In our work, we detected that in SLE groups IFN- γ serum concentrations were significantly higher than groups of control. Our results are followed by other studies [17,18,19]. Contrary to our research, Yu and Wang[20] indicated that SLE group IFN-γ concentrations

were lowerthancontrol group. They explained their result by the fact that Th1 or Th2 cells in different phases of the disease may have different functions. Furthermore, the small number of patients in their study that was only 20 and the short duration of the disease ranging from 1 to 35 months can explain this..

Positive correlation between IFN-γ anti-dsDNA titer that was supported by other studies [21,22]. There was a significant correlation between serum levels of IFN-γ and SLEDAI and there were vital differences in serum concentrations of IFN-γ between inactive and very high activity groups. Gigante et al. [23], Csiszaˆ r et al.[17], and Viallardet al.[24] agree with our result. On the other hand, El-Sayed et al.[19] and Harigaiet al.[25] found nocorrelation between IFN-γ and SLEDAI.

In case of TOC, it was significantly lower in both active and inactive patients than control .This distinction can be explained by the constant oxidative stress and protein oxidation that happens even with inactive disease or mild disease activity in SLE patients [26]. Other studies have shown that the use of biomarkers-oxidants and antioxidants has increased oxidative stress i SLE patients. Lozovoy and others(2011). [26] Plasma chemiluminescence has risen significantly, reflecting enhanced lipid hydroperoxides and decreased antioxidant concentrations. Zhang*et al.* (2010) [27] Confirm the presence of oxidative stress in SLE patients by measuring protein oxidation by multiple markers. Another research found significant increases in oxidative andnitrosative stress in SLE patients, indicating an imbalance between reactive oxygen manufacturing and the development of nitrogen species and antioxidantdefensemechanisms in SLE [28].

Conflict of interest: There is no conflict of interest among the authors.

Funding: Self

Ethical Clearance: This study is ethically approved by the Institutional ethical Committee.

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Comparative Effect of Mulligans Mobilisation Versus Stabilisation Exercise on Chronic Nonspecific Low Back Pain: A Pilot Study

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Abstract

Objectives: Objective of the study is to investigate the comparative effect of mulligan's mobilization over stabilization exercise among nonspecific low back pain patients,to reduce the pain intensity, to improve the functional ability, endurance,strength of spinal extensor muscles,lumbar spinal mobility among nonspecific low back pain patients.

Methodology: It is an Experimental study design which was done in Outpatient physiotherapy department, faculty of physiotherapy, Dr. MGR Educational & research institute and Abinaya physiotherapy clinics with the comparative pre and post type. 45 samples with Chronic Nonspecific Low Back Pain have been taken by Systematic Random Sampling method and allocated with 15 subjects in each group. The subjects in Group A (n=15) received Mulligan's mobilization, the subjects in Group B (n=15) received Stabilization exercises and control group C (n=15)**.** The study duration was 6 months (Base line with 3 follows up).

Result: On comparing Mean values of Group A, Group B & Group C there is a significant difference in the Post test Mean values at 4th week,12th week & 24th week but stabilization exercises (Group B) which has the Lower Mean value is effective than Mulligan MWM (Group A) and followed by conventional (Group C) at **P ≤ 0.05.**

Keywords: *Nonspecific low back pain, Endurance, Strength, Pain, Dynamometer.*

Introduction

Nonspecific low back pain is the fifth most common condition which affects nearly 60-80% of people throughout the lifetime[(1)]. The pathology of the nonspecific low back pain is unknown. Based on the duration of the symptoms or pain it is classified into three sub groups (acute, sub-acute, and chronic)[(2)].The prevalence of low back pain as high as 84%[(1,3)], the chronic lowback pain is about 23%, disabled due to chronic low back pain is about 11-12% [(3)].Back pain in most cases is nonspecific due to poor posture, stress, anxiety[(5)]. Chronic nonspecific low back pain is a typical musculoskeletal condition regularly resulting in physical inactivity and disability.

Mulligan mobilization is a unique concept of manual technique in a weight bearing position to treat variety of musculoskeletal conditions designed to reduce pain and improve the joint range of motion. The concept of the mulligan mobilization is to assist individuals to increases the restriction ROM and the functional restrictions. The mulligan technique involves mobilization with movements (MWM'S), Natural apophyseal glides

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(NAGS), Sustained natural apophysealglides (SNAGS). The fact in the mulligan concept of mobilization is multiple parameters must be used as outcome tool[6]

Stabilization exercise is the active form of therapeutic technique to improve the strength and stability of the spine and also help to prevent the low back pain [7]. It is progress in duration, intensity speed and variety. Stabilization exercise enhances stability via strengthening the deep muscles[8]. The aim of the study is to investigate the comparative effects of the mulligan mobilization and stabilization exercises. The null hypothesis states that there is no significant difference between Mulligan MWM, Stabilization Exercises and Conventional Exercises in Chronic Non Specific Low Back Pain.

Methodology

Experimental study design (PILOT STUDY), 45 subjects (both male and female) with non specific low back pain under the age group between 20 to 40 years was taken. Non specific LBP patients was categorized into three groups (n=45). Repetitive Motion, Torsion of spine, Pushing & Pulling activities, Stumbles, fall, Static/sitting work postures,Co-Contraction of muscles of Lumbar spine & Pelvis, Movement restrictions were included. The exclusion criteria is Inter vertebral disease, Facet joint degeneration, Annular tear, IVDP, Spondylolisthesis, spondylolysis, Ankylosing spondylitis, Nerve root compression,Malignant tumor, Hypertension, Pregnancy. The parameter such as Visual Analog Scale, Modified Oswestry Back Pain Disability Questionnaire, Chest Leg Dynamometer, Modified Schober's Test, Biering-Sorensen test was used.

Procedure: The 45 subjects was selected for the study according to the inclusion and exclusion criteria, with chronic nonspecific low back pain ascertained on the basis of Self administered questionnaire and they were randomly assigned in three groups, 15 subjects assigned for group-A, 15 subjects assigned for group-B and 15 subjects assigned for control group. Each subject is given intervention for 10 repetitions/exercise for 30 minutes per session with 3 session/week for 24 weeks. Group A: Mulligan's mobilization (n=15). During MWM with SNAGs the Belt is secured around the pelvis on ASIS and around therapist's gluteal folds. Therapist glides the spinous process by pushing it towards the eyeball direction of the patient. Patient is asked to perform the offending movement with the glide, which should now be pain free, 10 glides per session per movement. Group B: Stabilization exercises (n=15).Lumbar stabilization exercise program consists of stretching as a warm up (5min), Lumbar stabilization exercise (20 min) and stretching as a cool down (5min)Control Group C: conventional exercises (n=15). Conventional exercise consists of stretching as a warm up (5min), Cat & Camel exercise (20 min) and stretching as a cool down (5min)

Statistical Analysis: The collected data were tabulated and analyzed using both descriptive and inferential statistics. All the parameters were assessed using statistical package for social science (SPSS) version 24. One Way ANOVA includes of following tests (Test of Homogeneity of Variance, ANOVA, Post Hoc test Tukey HSD) (multiple comparison) was adopted to find statistical difference between three groups.

Table 1: Comparison of Pre & Post VAS Score Using Test of Homogeneity of Variance & One Anova Test between Group A, Group B and Group C

Test	Group A		Group B		Group C		df		F Value	Significance
	Mean	S.D.	Mean	S.D.	Mean	S.D.	df1	df2		
PRE	6.13	.743	6.20	.775	6.33	.617	2	42	.304	.739*
POST 4th week	4.47	.915	4.07	1.03	5.53	.743	2	42	10.52	.000**
POST 12th week	2.93	.961	2.00	1.13	4.87	.743	2	42	34.83	.000**
POST 24th week	1.87	.834	.930	.704	3.80	.862	2	42	49.75	.000**

Table 2: Comparison of Pre & Post MODQ Score Using Test of Homogeneity of Variance & One Anova Test between Group A, Group B and Group C

Test	Group A		Group B		Group C		Df		F value	Significance
	Mean	S.D	Mean	S.D	Mean	S.D	df1	df2		
PRE	64.73	7.31	62.00	4.81	64.00	6.55	2	42	.753	.477*
POST 4th week	40.73	2.40	45.93	3.49	53.80	7.70	2	42	25.19	.000**
POST 12th week	32.27	3.59	34.73	3.36	37.53	2.94	2	42	9.47	.000**
POST 24th week	26.4	4.35	15.20	4.03	32.33	3.63	2	42	70.20	.000**

Table 3: Comparison of Pre & Post Modified schobers test (Flexion) using Test of Homogeneity of Variance & One Anova Test between Group A, Group B and Group C

Test	GROUP A		GROUP B		GROUP C		df		F value	Significance
	Mean	S.D	Mean	S.D	Mean	S.D	df1	df2		
PRE	3.43	.399	3.31	.464	3.42	.431	2	42	.318	.729*
POST 4th week	3.86	.456	4.11	.393	3.64	.462	2	42	4.24	.021**
POST 12th week	4.37	.443	5.03	.517	3.97	.430	2	42	19.69	.000**
POST 24th week	4.97	.480	5.88	.620	4.30	.450	2	42	34.08	.000**

Table 4: Comparison of Pre & Post Modified schobers test (Extension) using Test of Homogeneity of Variance & One Anova Test between Group A, Group B and Group C

Test	Group A		Group B		Group C		df		F value	Significance
	Mean	S.D	Mean	S.D	Mean	S.D	df1	df2		
PRE	1.22	.327	1.18	.451	1.16	.364	2	42	.096	.909*
POST 4th week	1.46	.330	1.37	.358	1.23	.377	2	42	1.56	.220*
POST 12th week	1.76	.350	1.74	.352	1.28	.365	2	42	8.90	.000**
POST 24th week	2.19	.286	2.40	.308	1.32	.365	2	42	48.01	.000**

Table 5: Comparison of Pre & Post BLC Dynamometer using Test of Homogeneity of Variance & One Anova Test between Group A, Group B and Group C

Test	Group A		Group B		Group C		df		F value	Significance
	Mean	S.D	Mean	S.D	Mean	S.D	df1	df2		
PRE	39.60	14.14	38.40	14.55	41.20	14.13	2	42	.145	.865*
POST 4th week	46.27	13.25	48.33	16.92	44.47	14.26	2	42	.253	.778*
POST 12th week	52.60	11.72	60.33	17.80	46.33	13.68	2	42	3.44	.041**
POST 24th week	61.67	10.25	68.73	17.83	49.53	14.56	2	42	6.68	.003**

Table 6: Comparison of Pre & Post Biering Sorensen Test using Test of Homogeneity of Variance & One Anova Test between Group A, Group B and Group C

Test	Group A		Group B		Group C		df		F value	Significance
	Mean	S.D	Mean	S.D	Mean	S.D	df1	df2		
PRE	25.60	4.85	24.60	4.86	23.87	4.73	2	42	.489	.617*
POST 4th week	29.87	6.37	31.73	6.67	27.07	4.69	2	42	2.31	.111*
POST 12th week	36.07	7.02	40.27	8.98	30.13	4.32	2	42	7.83	.000**
POST 24th week	43.93	8.71	48.40	11.45	33.60	4.15	2	42	11.56	.000**

Result

On comparing Mean values of Group A, Group B & Group C on VAS, MODQ and Modified Schobers Test (Extension) significant decrease in the Post test Mean values at 4th week, 12th week & 24th week but stabilization exercises (Group B) which has the Lower Mean value is effective than Mulligan MWM (Group A) and followed by conventional (Group C) at **P ≤ 0.05.** On Modified Schobers Test (Flexion) BLC Dynamometer and Biering Sorensen Test shows significant Increase in the Post test Mean values at 12th week & 24th week but stabilization exercises (Group B) which has the Higher Mean value is effective than Mulligan MWM (Group A) and followed by conventional (Group C) at **P ≤ 0.05.** Hence Null Hypothesis is rejected.

Discussion

The purpose of the study is to analyze the efficacy of mulligan mobilization and stabilization exercise on chronic non- specific low back pain. It reveals that the stabilization exercise is effective when compared to the mulligan mobilization and it shows there is a significant difference in pre and post test values.

In (table- 1), VAS score shows that there is a significant difference in post test values (.000) when compared to the pre test values (.739) of all the three groups. In (table- 2), MODQ score shows that there is a significant difference in post test values (.000) when compared to the pre test values (.477) of all the three groups. In (table- 3), Modified schobers test (flexion) shows that there is a significant difference in post test values (.000) in 4th week (.021) when compared to the pre test values (.729) of all the three groups. In (table- 4), Modified schobers test (extension) there is a significant difference in post test values (.000) in 4th week (.220) but in the 1st day of pre test and 4th week of post test it shows no significant difference (.909). In (table- 5), BLC Dynamometer shows that there is a significant difference in post test values, in 4th week (.778) in 12th week (.41) in 24th week (.03) when compared to pre test value (.865). In (table- 6), Beiring Sorensen test shows that there is a significant difference in post test values (.000) but in the 1st day of pre test and 4th week of post test value (.111) it shows no significant difference (.617).

Mohammed Reza Pourahmadi et al (2018), concluded that the mulligan techniques decreases pain and disability and increases the ROM and their evidence is insufficient in supporting the benefits of the mulligan techniques. Min Yeong Heo et al (2015), the combination of lumbar stabilization and thoracic mobilization exercise showed greater effects in decreasing pain and increasing in functional ability and stability of the joints and increase the ROM.The effects of the lumbar stabilization is to reduce the biomechanical stress maximally in order to perform functional movements, it also reduces pain and increases the joint range of motion, seong-rae yang et al (2015). The therapeutic effect of the mulligan mobilization is to prevent the painful and limited range of motion as it corrects the positional faults in a facet joint (Hisham Mohammed hussien et al, 2017) .The hypothesis stated there is no significant difference between Mulligan MWM and there is significant difference in stabilization exercises and conventional exercises in Chronic Non Specific Low Back Pain.

Conclusion

The current study concluded that 6 months (Base line with 3 follows up)treatment program using mulligan mobilization and stabilization exercise with non-specific chronic low back pain showed that both the interventions

were effective. This study suggested that comparatively stabilization exercise showed statistically high significant improvement than mulligan mobilization.

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Factors Associated with Work Fatigue in Workers of the Nipah Building Construction Project Makassar

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Abstract

The International Labor Organization says almost every year as many as two million workers die from workplace accidents caused by work fatigue. Construction workers are one of the workers who have a heavy type of work. Working with heavy workloads and working hours beyond normal limits makes construction workers easily got fatigue. This study aims to determine the relationship of age of workers, length of work, work period, workload and nutritional status with work fatigue in construction workers in the Nipah building, Makassar. This type of research is observational analytic with a *cross-sectionalapproach*. Data collection was conducted in December 2017 against 74 workers as samples taken by *purposive sampling technique.* Fatigue measurements were performed using a *reaction timer,* the work load using *digital Omron*, the nutritional status by Body Mass Index using scales and *microtoice*, and the length of work and work period using a questionnaire. Data analysis carried out was univariate and bivariate with test *chi-square*. The results showed that there was a relationship between age of workers, length of work, work period, workload and nutritional status with work fatigue. The conclusion of this study is that there is a relationship between age of workers, length of work, work period, workload and nutritional status with work fatigue in construction workers in the Nipah building, Makassar.

Keywords: *Job Fatigue, Construction, Construction Workers.*

Introduction

Workers in carrying out their work are at risk of getting workplace accidents and occupational diseases. Accidents and illnesses due to work are usually preceded by the disruption of comfort and health and a decrease in work productivity. One of the health problems that can precede accidents and diseases due to work is the emergence of work fatigue. Fatigue is a process of decreasing efficiency, work performance and reduced physical strength or endurance to continue activities that must be done[1].

The working atmosphere with unhealthy, uncomfortable and unsafe environmental conditions will trigger work fatigue. Work fatigue is a phenomenon that is often experienced by workers but this cannot be ignored because it is related to the protection of the health of workers. The results of the study stated that of 80% of *human errors*, 50% were caused by work fatigue[2]. Fatigue is characterized by the weakening of labor in carrying out work or activities so that it will increase errors in doing work and the fatal consequence of the occurrence of workplace accidents[3].

According to the *International Labour Organization* (ILO), every year as many as two million workers die from workplace accidents caused by fatigue. In the study explained from 58,115 samples, 18,828 of them (32.8%) experienced fatigue. Whereas if the worker experiences a work accident caused by fatigue, it will

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have a direct impact on the level of work productivity. So human factors are very influential on the level of work productivity, such as sleep problems, biological needs, and also work fatigue, even expressed that the decline in labor productivity in the field is largely due to work fatigue[4].

In Indonesia, work accidents due to unsafe labor behavior reached 31,776 cases (32.06%) of the total cases during 2009 which included fatigue conditions of workers while working and others including being undisciplined in the use of personal protective equipment. Thus, it can be concluded that the main factors causing work neglect include unsafe behavior factors and unsafe conditions[5]. Factors that cause fatigue vary greatly, which is influenced by workload, work environment, *problems*physicaland health conditions can also be influenced by individual factors such as age, health status, nutritional status, diet, gender,and psychological conditions[6].

Based on research on fatigue factors in the field of construction projects, it was found that all workers experienced fatigue, namely 29% mild fatigue, 45% moderate fatigue and 26% severe fatigue. The results showed that there were 3 variables that had a significant relationship with fatigue, namely age, heat pressure,and noise. While the most dominant variable associated with fatigue is heated pressure[7].

Individual factors such as age have a significant relationship to the occurrence of fatigue, where age is related to the process of organ degeneration which causes a decrease in the ability of organs so that the workforce becomes more easily fatigued[8]. Workers who have excessive working hours and overtime working hours beyond the ability limit can accelerate fatigue, reduce the accuracy, accuracy,and accuracy of work[9]. Fatigue is closely related to feeling bored due to monotonous work. The same work done repeatedly from day to day without any variation can cause boredom, bored and tired quickly[10]. Repeated working conditions can create a monotonous atmosphere that accumulates into boredom, where boredom is categorized as fatigue[11].

Work fatigue is a potential disorder that occurs in all workers, especially in the construction sector. Some studies show factors that correlate with work fatigue. This study aims to determine whether there is a relationship between age of workers, length of work, work period, workload and nutritional status with work fatigue in construction workers in the Nipah building, Makassar.

Materials and Method

The type of research used was observational analytic with a *cross-sectionalapproach*. This research was carried out in the construction project of the Nipah building, Makassar in December 2017. The population in this study were workers in the construction project of the Nipah building, Makassar which numbered 307 people. The sample was obtained by *purposive sampling method* which is 74 people. Retrieval of data by measuring fatigue using *L77 lakassidaya reaction timer,* workload measurement using *digital Omron type AI2,* measurement of nutritional status by Body Mass Index (BMI) using scales and *microtoice,* as well as the length of work data and work period data using a questionnaire. Data analysis performed was univariate and bivariate using the test *chi-square* by presenting data in the form of tabulations and narratives.

Findings:

Table 1: Work Fatigue

Work Fatigue	Frequency	Percent (%)
Positive	59	79.7
Negative	15	20.3
Total	74	100

Most workers experience work fatigue. The results of the work fatigue measurements using the *reaction timer*, it was found that more workers who experienced fatigue were 59 workers (79.7%)while the workers who did not experience fatigue were 15 workers (20.3%).

Table 2: The Relationship between Age of Workers and Work Fatigue

Age of Workers	Work Fatigue		N	P-value
	Positive	Negative		
Old	30	1	31	0,002
	96.8%	3.20%	100%	
Young	29	14	43	
	67.4%	32.6%	100%	
Total	59	15	74	
	79.7%	20.3%	100%	

There is a relationship between age of workers and work fatigue in construction project workers.

The results of 74 respondents, workers who

experienced work fatigue with old age categories were 30 respondents (96.8%) and young age categories were 29 respondents (67.4%). While respondents who did not experience work fatigue in the old age category were 1 respondent (3.20%) and in the young category, 14 respondents (32.6%).

In this study workers who experience,fatigue tends to be experienced by workers who are old or have 35 years of age or older than workers who are still young. This is because in general, the advanced age of a person's physical abilities is definitely decreasing. Someone who is young can-do heavy work and vice versa if someone is old then his ability to do heavy work decreases. Older workers will feel tired quickly and cannot move freely when carrying out their duties which affect their performance. Setyawati said that workers aged 40-50 years would suffer fatigue faster than the relatively younger workforce. Old-aged workers will experience a decrease in muscle strength which results in fatigue in doing their work and a decrease in muscle strength will cause muscle fatigue that occurs due to the accumulation of lactic acid in the muscle[12].

Table 3. The Relationship between Length of Work and Work Fatigue

Length of Work	Work Fatigue		N	P-value
	Positive	Negative		
Inappropriate	52	9	61	0.011
	85.2%	14.8%	100%	
Appropriate	7	6	13	
	53.8%	46.2%	100%	
Total	59	15	74	
	79.7%	20.3%	100%	

There is a relationship between the length of work and work fatigue in construction project workers.

The results of 74 respondents, workers who experienced work fatigue with an inappropriate length of work were 52 respondents (85.2%) and who have an appropriate length of work were 7 respondents (53.8%). While respondents who did not experience work fatigue with an inappropriate length of work namely 9 respondents (14.8%) and eligible categories, namely 6 respondents (46.2%).

In this study, workers whose work duration inappropriate or more than 8 hours experience more fatigue than workers who have an appropriate length of work. This is in line with Suma'mur which states that if someone does physical work, but does not do variations in work and in a time that exceeds the predetermined limit for a worker in a day it will cause contraction of the muscles of the abdominal support continuously in the long run[2].

Table 4. The Relationship between Work Period and Work Fatigue

Work Period	Work Fatigue		N	P-value
	Positive	Negative		
Old	42	5	47	0.007
	89.4%	10.6%	100%	
New	17	10	27	
	63.0%	37.0%	100%	
Total	59	15	74	
	79.7%	20.3%	100%	

There is a relationship between the work period and work fatigue in construction project workers.

The results of 74 respondents, workers who experienced work fatigue with the old work period were 42 respondents (89.4%) and new categories namely 17 respondents (63.0%). While respondents who did not experience work fatigue in the old working period were 5 respondents (10.6%) and in the new category were 10 respondents (37.0%).

Workers who have a long working period tend to experience fatigue compared to workers whose work period is classified as new. This affects the feeling of saturation due to the work carried out continuously which affects the level of fatigue experienced by construction workers. According to Suma'mur, a long period of work for work carried out in a monotonous and continuous manner can cause feelings of fatigue[13].

Table 5. The Relationship between Workload and Work Fatigue

Workload	Work Fatigue		N	P-value
	Positive	Negative		
Heavy	27	2	29	0.036
	93.1%	6.90%	100%	
Light	32	13	45	
	71.1%	28.9%	100%	
Total	59	15	74	
	79.7%	20.3%	100%	

There is a relationship between workload and work fatigue in construction project workers.

The results showed that respondents who experienced work fatigue with heavy workload categories were 27 respondents (93.1%) and light categories were 32 respondents (71.1%). While respondents who did not experience work fatigue in the heavy workload category were 2 respondents (6.90%) and in the light category, 13 respondents (28.9%).

The workload is one factor that also affects fatigue. Workers who experience fatigue are more experienced by workers with heavy workloads than workers with light workloads. This happens because the heavier the workload of someone, the ability of someone to work is also required to balance the workload. In this case, workers who have a heavy workload are not matched by their ability to work so that fatigue is easy. This is in line with the theory according to Munandar that every workload must be in accordance with physical abilities, cognitive abilities, as well as the limitations of humans who receive the burden[14]. The heavy or lightness of the workload received by a person can be used to determine how long the person can do the work in accordance with the work capacity concerned.

Table 6. The Relationship between Nutritional Status and Work Fatigue

Nutritional Status	Work Fatigue		N	P-value
	Positive	Negative		
Abnormal	21	1	22	0.030
	95.5%	4.50%	100%	
Normal	38	14	52	
	73.1%	26.9%	100%	
Total	59	15	74	
	79.7%	20.3%	100%	

There is a relationship between nutritional status and work fatigue in construction project workers.

The results of 74 respondents, workers who experienced work fatigue in the category of abnormal nutritional status were 21 respondents (95.5%) and normal categories were 38 respondents (73.1%). While respondents who did not experience work fatigue in the category of abnormal nutritional status were 1 respondent (4.50%) and in the normal category, 14 respondents (26.9%).

In this study more workers who experienced fatigue were included in workers whose nutritional status was abnormal compared to workers who had normal nutritional status. The imbalance between the energy needed by the body and the amount of energy received by the body affects the efficiency and productivity of workers, so workers easily experience fatigue. Kusmawan stated that energy intake is needed by the workforce to maintain the body's condition to always be excellent, lack of energy intake results in health problems and work productivity[15]. The level of energy intake, especially for heavy workers is a determinant of the degree of work productivity. Heavy workers, if not balanced with sufficient energy intake, usually will speed up fatigue.

Conclusion

Based on the results of the study, it can be concluded that most workers experience fatigue, the majority of workers are young, most workers have an inappropriate length of work, most workers have a long working period, most workers have a light workload and the majority of workers have normal nutritional status.

There is a relationship between age of workers, length of work, work period, workload and nutritional status with work fatigue in construction workers in the Nipah building, Makassar.

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All subjects were fully informed about the procedures and objectives of this study each subject prior to the study signed an informed consent form.

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Quality Evaluation of Health Services at Community Health Centers: through Accreditation Surveys in Indonesia

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Abstract

Introduction: Community health centers as primary health care centers are required to be able to provide quality assurance services to the community. The current problems of the Community Health Centre are the low quality of services, the lack of standardized infrastructure, and the low number of quality human resources, and high constant of patients' complaints. The aim of this study is to evaluate the quality of health services at community health centers.

Material and Method: The research method is an observational study by taking data in 13 provinces in Indonesia for 3 years (2016-2018). A total of 45 randomly selected community health centers were evaluated for 3 days per health community center using an accreditation instrument that had been prepared and established by the Indonesian Ministry of Health consisting of 9 chapters, 42 standards, 168 criteria, and 776 assessment elements.

Finding and Discussion: The results showed that there were 2.2% of the community health centers which are not accredited, while the other 97.8% are accredited. The basic accreditation status was 45.5%. The status of intermediate accreditation was 40.9%. The main accreditation status was 13.6%. There was no plenary status of accreditation.

Conclusion: The conclusion of the study was that there are more community health centers with basic accreditation status so management supervision, human resources, facilities and infrastructure, and innovation of the community health center still needs to be improved.

Keywords: *Accreditation Status, Community Health Center, Service quality.*

Introduction

The World Health Organization (WHO) uses an accreditation system to evaluate the health service process to improve the quality of services provided to patients[1]. WHO recommends that each country ensures the quality of health services received by the citizens[2,3]. The aim of health development is to increase awareness, willingness and ability to live healthy for everyone in order to manifest optimal public health degrees. In order to achieve these objectives, various comprehensive, tiered and integrated health efforts were held. Minister of Health Regulation No.75 of 2014 concerning Public Health Centers stated that the community health center function as organizing the first level of Public Health

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(SME) and Health Efforts (UKP) by prioritizing promotive and preventive efforts to achieve the highest degree of public health in its working area[4].

Community health centers which are the frontline of health services have to provide quality assurance for health services to all residents in their working areas, therefore through Minister of Health Regulation Number 46 of 2015 has mandated the implementation of health center accreditation. Efforts to improve the quality of health services at the community health center level have been implemented nationally since 2015. However, these efforts are considered not sustainable because accreditation is considered as the end of quality. Historically accreditation is a process of assessment and monitoring through measurement of compliance with standards, the *Institute of Medicine* (IOM) report has produced a results-based quality improvement approach. The audit results and quality components implemented are yet difficult to determine the accreditation benefits of improving quality and patient safety[5].

The research conducted by Heuer which connects two indicators of quality, accreditation and patient satisfaction to 41 hospitals that have received accreditation scores from the *Commission on Accreditation of Healthcare Organizations* showed that there is no significant relationship between accreditation scores that represent the quality of service and patients' satisfaction rate who are the indicators of service quality. The success of policy implementation will be determined by many variables or factors, and each of these variables is related to each other[6,7,8].

Indonesia has 9,913 health centers, of which 7,508 were accredited community health center, and 2,405 community health centers had not been accredited. Although most have been accredited, community health center has yet fully provided maximum contribution to health services to the community, as a result, the community chooses to use clinical services, independent practice, hospitals, and other health facilities. In addition, the image and appearance of community health centers received less attention. The presence of leaders and staff have not been able to implement community health center management, low compliance with standards and guidelines in carrying out activities. Inability of community health center leaders to manage the culture and religion of their staff, staff incompetence in identifying innovation opportunities in improving performance achievement, inadequate quality team and Community health center internal audit team, and facilities and infrastructure issues, as well as inability to guarantee continuous quality improvement efforts.

Unsustainable quality improvement will have an impact on low patients' satisfaction, lack of trust in health services, increased morbidity and mortality, increased maternal mortality, infant mortality, under-five mortality, decreased life expectancy, and low community health status, on the other side processes for accreditation of community health center have been implemented nationally. By these various problems, an evaluation of quality of health service on the community health center will be carried out through an accreditation survey in Indonesia.

Community health center known as Puskesmas is the First Level Health Facility (FKTP) which is responsible for the health of the community in its area in one or part of the sub-district. In the Minister of Health Regulation Number 75 of 2014 concerning Public Health Centers, it is stated that the Community health center is the Regional Technical Implementation Unit (UPTD) of the District/City Health Office. The success of the Community health center can be carried out by the internal organization of the Community health center itself, which is "Community health center Performance Assessment," which includes management of resources including tools, medicine, finance and labor, and supported by management of recording and reporting systems, called Community health center Management Information Systems (SIMPUS).

Materials and Method

The method used was an observational study conducted in 13 provinces in Indonesia for 3 years (2016-2018). Out of the 76 community health centers that have been prepared, 45 health centers were randomly selected. The chosen community health centers were observed or evaluated for 3 days in each community health center using an accreditation instrument that had been prepared and stipulated by the Indonesian Ministry of Health consisting of 9 chapters, 42 standards, 168 criteria, and 776 assessment elements.

Findings and Discussion

Based on table 1, it shows that 44 (97.8%) community health centers were accredited and 1 (2.2%) health centers were not accredited.

Table 1. Distribution of Accredited Community Health Centers

Accreditation	F	%
Accredited	44	97.8
Not Accredited	1	2.2

Based on table 2, out of 44 (97.8%) accredited community health centers, the result was the basic accreditation status were 20 (45.5%) community health centers, middle accreditation status were 18 (40.9%) community health centers, main accreditation status were 6 (13.6%) community health center, and there was no plenary accreditation status.

According to table 3, the basic accreditation status was 45.5% with the characteristics of the working area, namely urban areas as much as 20%, rural areas as much as 45%, remote and very remote areas as much as 35%, with the ability to administer namely 45% non-hospitalization and 55% hospitalization. Intermediate accreditation status is as much as 40.9% with the characteristics of the working area namely urban areas as much as 16.7%, rural areas as much as 72.2%, remote and very remote areas as much as 11.1%, with the ability to administer namely non-hospitalization 38.9% and hospitalization 61.1%.

Table 2. Distribution of Community health center Accreditation Status

Accreditation Status	F	%
Basic	20	45.5
Intermediate	18	40.9
Prime	6	13.6
Plenary	0	0

Table 3. Distribution of Accredited Health Centers based on work area and organization of Community Health Center

Accreditation	Work Area						Management			
	Urban		Rural		Remote		Out patient		Inpatient	
	F	%	f	%	F	%	f	%	F	%
Basic	4	20	9	45	7	35	11	55	9	45
Intermediate	3	16.7	13	72.2	2	11.1	7	38.9	11	61.1
Prime	2	33.3	3	50.0	1	11.1	2	33.3	4	66.7
Plenary	0	-	0	-	0	-	0	-	0	-

Prime accreditation status is 13.6% with the characteristics of the working area, namely urban areas as much as 33.3%, rural areas as much as 50.0%, remote and very remote areas as much as 16.7%, with the ability to administer namely non-hospitalization 33.3% and hospitalization 66.7%. There is no plenary status accreditation.

The community health center must be accredited periodically at least for 3 years (Regulation of the Minister of Health no.75 year 2014 article 39), as well as accreditation is a credential requirement as a first-level health service facility in collaboration with BPJS. The approach uses in accreditation is the safety and rights of patients and families, while still paying attention to the rights of the officers. This principle is enforced to ensure that all patients get the best service and information in accordance with the needs and conditions of patients, regardless of social, economic, educational, gender, race or ethnicity. In order to improve the quality of the community health center, the Management Team must be able to work excellently and professionally, under the coordination and supervision of the head of the Community health center who performs their good and appropriate leadership functions according to the situation and conditions.

Provided health efforts must always pay attention to interests, needs, and expectations of the community as external consumers, the interests and satisfaction of all Community health center staff as internal consumers, and support for community health center facilities and infrastructure because the district/city government is the owner. For this reason, the District/City must prepare a Community health center to analyze the needs of services and the availability of Community health center

resources (based on Minister of Health Regulation number 75 of 2014) and assistance for Pre-Accreditation, Surveys to Post Accreditation Assistance. Accreditation according to Minister of Health Regulation No. 46 of 2015.

Accreditation based on Minister of Health Regulation number 46 of 2015 concerning Health Center Accreditation, Primary Clinics, Doctor's Independent Practice, and Dentist's Independent Practice, namely recognition given by independent institutions administering Accreditation determined by the Minister after meeting standards Accreditation.

The main purpose of Accreditation is to foster quality improvement, performance through continuous improvement of management systems, quality management systems, and clinical service delivery systems, and the application of risk management, and not just an assessment to get an accreditation certificate. Based on several other literatures, accreditation is the competence of an institution in carrying out activities in the form of formal recognition given by the accreditation body to certain suitability. Accreditation is an activity that examines all components as part of the process. The components reviewed are related to the structure that is in it[9]. The aim is to improve sustainable and continuous standards. Research results of Shaw in 73 hospitals in Europe showed that accreditation had an effect on the quality management of the services provided[10].

Accreditation is very much related primarily to clinical leadership and patient safety systems. In summary, it can be concluded that accreditation is an activity carried out to obtain formal recognition towards achieving a standard. The main achievement was in the form of continuous improvement in quality and performance. Minister of Health Regulation No. 46 of 2015 is a policy that sets standards and instruments for evaluating Community health center accreditation in providing first-rate services to the public. In articles 3 and 4, it was explained that the community health center must be accredited every 3 (three) years. Determination of accreditation status is the final result of the accreditation survey by surveyors and decisions of meetings of independent accreditation organizers. This determination was proven by the existence of an accreditation certificate.

The Accreditation Status of the Community health center consists of (1) Not accredited; (2) Basic accreditation; (3) Intermediate accredited, (4) Prime Accredited and (5) Plenary accredited. The District/ City Health Office prepares the Pre-accreditation steps until post-Community health center accreditation from the establishment of District/City Facilitation Teams, Community health center Facilities and Infrastructures, District/City APBD Budgeting and Human Resource according to their Competencies. Pre-accreditation assistance is a series of activities to prepare Community health center to meet Accreditation standards, while post-accreditation assistance is an activity to maintain and improve the achievement of accreditation standards continuously until the next accreditation assessment is conducted. Accreditation is used as an external evaluation instrument for patient quality and safety. For continuous quality improvement after post-accreditation, the Companion team works on orders and responsibilities to the head of the District/City Health Service.

Quality assurance is a concept that aims to achieve guaranteed quality of health services on an ongoing basis based on established standards. Its achievements are more emphasized in the service process in accordance with the standards so as to prevent the occurrence of services that do not meet the standards. Continuous quality assurance can be implemented if a quality system is implemented in the management of a good organization. This situation makes the organization will strive to provide services even exceeding the standard. This situation is because it focuses on internal and external customer satisfaction. Quality assurance is one form of improving service quality. The tools used in improving the quality of service consist of various types depending on the service organization. Enhancement tools used include accreditation and Quality Management System ISO 9000.

Accreditation itself is a tool that emphasizes structures. Safety culture is also an important aspect because according to Budiharjo this culture describes the provided services and is one of the efforts in quality assurance[11]. Culture is not only limited to slogans but is strategically linked to a system of socialization, Human Resource strategy, technology, training and example. Cable (1998) in Bustami (2011) reveals the key to the quality of health services, namely systems thinking, teamwork approach, leadership and continuous quality improvement. Bustami (2011) explains that based on his experience there were 6 things that can be achieved in quality assurance. The achievements are: (1) thorough examination, (2) the utilization of facilities and tools

becomes better, (3) more precise and economical treatment (4) more adequate information for patients, (5) more friendly and sympathetic services provided so tpatient trust increases, (6) results will be more effective and efficient[12,13,14].

Conclusions

Community health center with higher basic accreditation status, which is as much as 45.5% with work areas in rural areas and outpatient, so that management, human resources, facilities, and infrastructure need to be improved, and innovations for the community health center.

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Hypoglicemic and Antioxidant Activity of Yellow Pumpkin (Curcubitamoschata) in Diabetic Rats

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Abstract

Diabetes mellitus is a metabolic disorder characterized by chronic hyperglycemia due to disorders of insulin secretion, insulin sensitivity, or both. The main mode of diabetes control can be achieved with diet, exercise, and insulin replacement therapy nor with various oral hypoglycemic drugs. Diabetes mellitus also results in disorder of the lipid profile of the body so that the cells are more susceptible to lipid peroxidation. Malondialdehyde (MDA) is formed as a result of lipid peroxidation that can be used to measure lipid peroxidized. It has been reported that the polysaccharide from the pumpkin (Cucucrbitamoschata) has hypoglycemic activity by increasing plasma insulin.

This study aims to determine the activity of hypoglycemic, and the effect of hepatoprotective pumpkin in alloxan-induced diabetic rats by 30 Rattus norvegicus, divided into 6 groups of 5 each. Group K (-) was the negative control group without treatment, K (+) of untreated diabetic control group, TC1, TC2, TC4 were grouped with pumpkin flour with 1, 2 and 4 gram/kg bwt for 21 day by gavage, and the diabetic group given glibenclamide 0.45 mg/kg body weight. The hypoglycemic effect was determined by measuring the blood glucose level, the antioxidant effect determined by measuring the activity of AST and ALT enzymes and the serum malondialdehyde levels.

The results of this study showed that the pumpkin flour had the hypoglycemic effect of lowering blood glucose level at 4 g/kg bwt doses equivalent to Glibenclamide 0.45 mg/kg bwt ($p > 0.05$); had antioxidant activity by decreasing the activity of AST and ALT enzymes ($p < 0.05$) and decreasing malondialdehid levels in diabetic rats ($p < 0.05$).

Keywords: *Hypoglycemic; Antioxidant; Pumpkin; Cucurbita.*

Introduction

Diabetes is a serious chronic disease that occurs when the pancreas does not produce enough insulin (a hormone that regulates blood sugar or glucose), or if the body cannot effectively use the insulin it produces. Diabetes is an important public health problem, one of four priority non-communicable diseases (Non Communicable Disseases). Both the number of cases and the prevalence of diabetes have continued to increase over the past few decades. Diabetes of all types can cause complications in many parts of the body and may increase the risk of death as a whole early. Possible complications include heart attack, stroke, kidney failure, leg amputation, loss of vision and nerve damage.[1]

Hyperglycemia in DM increases the risk of microvascular damage (retinopathy, nephropathy and neuropathy) and macrovascular (ischemic heart disease, stroke and peripheral vascular disease). This results in a decrease in quality of life, a decrease in life expectancy, and even death can occur due to these complications.[2]

Diabetes mellitus results in disruption of the body's lipid profile so that cells are more susceptible to lipid peroxidation. Experimental studies show that

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polyunsaturated fatty acids in cell membranes are very susceptible to attack by free radicals because of the many bonds. Lipid hyperperoxide (LHP) through a radical reaction between producing a highly reactive and toxic lipid radical that forms a new LHP.[3] The resulting lipidperoxide often decomposes into radicals, which in turn react with the most biologically important molecules such as proteins and lipids. Further decomposition of this lipid peroxide produces toxic malondialdehyde (MDA).[4] Malondialdehyde (MDA) is formed as a result of lipid peroxidation which can be used to measure lipid peroxide.[3]

Pumpkin is a plant that has often been used as a functional food or medicine. For hundreds of years, pumpkin has been considered as a traditional Chinese medicine used for the prevention and treatment of various diseases such as hypertension, hypercholesterolemia, tumors, immunological disorders and DM. It has been reported that polysaccharides of pumpkin (PP) have hypoglycemic activity by increasing plasma insulin in normal mice and diabetes.[5]

Material and Method

Pumpkin is obtained from traditional markets in Yogyakarta, Indonesia. White rats Rattus norvegicus Wistar strain obtained from Universitas Gadjah Mada Yogyakarta. Ingredients: ethanol, CMC (carboxy methyl cellulose), Glucose reagent kits, AST and ALT from Sigma and tiobarbiturate (TBA) reagents from Sigma. Instruments and tools: syringes, spectrophotometers, automatic pipettes 10 µl, 20 µl, 100 µl, 1000 µl, vial, white tip, yellow tip, blue tip, test tube.

The making of pumpkin flour is carried out in the laboratory of the Medical Laboratory Technology Department as follows: the pumpkin is peeled, the flesh is taken, shredded and dried in an oven at a temperature of 50-60^{o}C for 72 hours, then mashed with blender and sifted.

The treatment of experimental animals is carried out in the Central Food and Nutrition Laboratory of the Gadjah Mada University, as follows:

1. 30 rats, acclimatized using individual cages for 3 days with room temperatures ranging from 25-280 C and 12 hours daily lighting cycles. During acclimatization and during the study rats were fed standard AD II and drinking water in ad libitum.
2. Rats were divided into 6 groups, each consisting of 5 animals, namely K(-), K(+), TC1, TC2, and TC4.
3. The blood sample were taken from the retroorbital vein, then their blood glucose levels were determined.
4. Group K (-) is a negative control group without treatment, group K (+), TC1, TC2, TC4 made diabetic by giving glibenclamide at a dose of 0.45 mg/kg.
5. On day 3, all rats were determined by their blood glucose levels, AST enzyme activity, ALT and malondialdehyde levels (pre test).
6. The TC1, TC2, TC4 groups were given pumpkin flour with doses of 1, 2 and 4 grams/kg for 21 days using feeding tube, and the diabetic group given glibenclamide 0.45 mg/kg.
7. After 24 hours of the last treatment, rat blood was taken for determination of blood glucose levels, AST enzyme activity, ALT and malondialdehyde levels (post test).

Determination of blood glucose levels using the enzymatic GOD-PAP method, AST and ALT enzyme activity by kinetic enzymatic method, and malondialdehyde levels carried out by the TBA method.

Result and Discussion

Administration of yellow pumpkin flour in diabetic rats can reduce blood glucose levels, presented in the following figure:

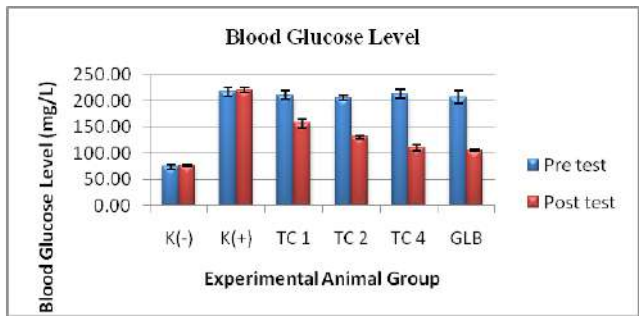

Figure 1. Blood Glucose Level Chart in Diabetic Rats

Administration of yellow pumpkin flour in diabetic rats can decrease AST and ALT enzyme activity, presented in the following figure:

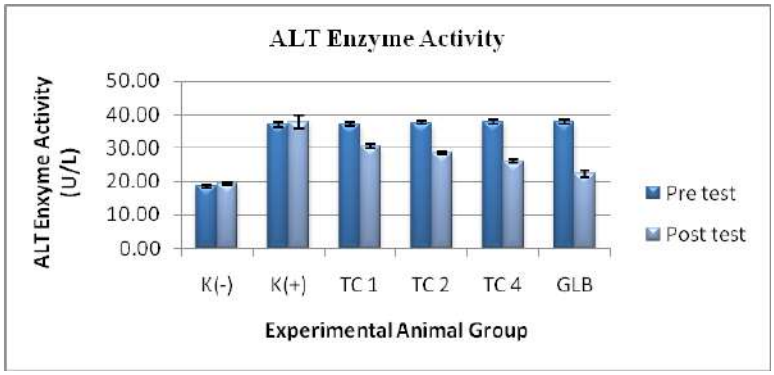

Figure 2. ALT Enzyme Activity Chart

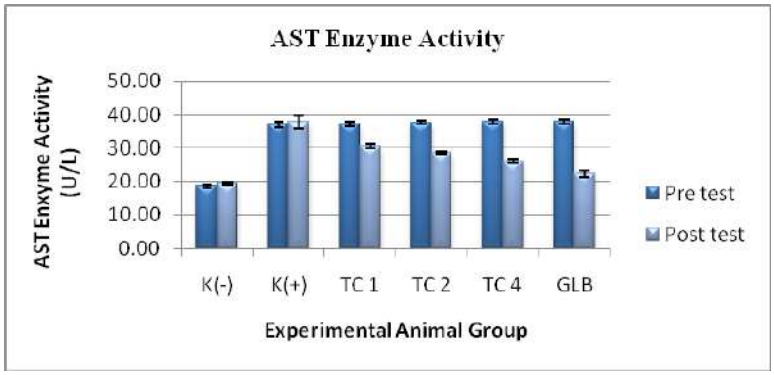

Figure 3. AST Enzyme Activity Chart

Administration of yellow pumpkin flour in diabetic rats can malondialdehyde levels, presented in the following figure:

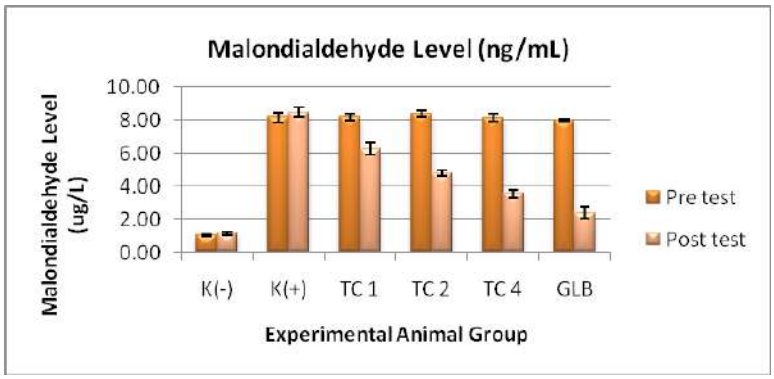

Figure 4. Malondialdehyde Level

The data obtained were analyzed statistically with the following results:

Group	Glukosa mg/dL			ALT U/L			AST U/L			MDA nmol/ml		
K(-)	77.14^{a}	±	1.94	19.32^{a}	±	0.41	38.35^{a}	±	0.77	1.13^{a}	±	0.09
K(+)	221.08^{b}	±	5.16	37.87^{b}	±	1.97	78.26^{b}	±	1.70	8.45^{b}	±	0.28
TC 1	157.44^{c}	±	8.21	30.49^{c}	±	0.72	58.16^{c}	±	2.56	6.26^{c}	±	0.34
TC 2	130.82^{d}	±	3.06	28.55^{d}	±	0.41	49.13^{d}	±	1.43	4.79^{d}	±	0.19
TC 4	110.95^{e}	±	4.78	26.02^{e}	±	0.55	43.31^{e}	±	1.21	3.54^{e}	±	0.22
GLB	106.10^{e}	±	0.62	22.33^{f}	±	1.03	40.88^{f}	±	1.25	2.39^{f}	±	0.37

Annotation: the numbers in the same column with different superscript letters show significant differences ($p < 0.05$)

Administration of yellow pumpkin flour for 21 days with a dose of 1 g/kg, 2 g/kg, and 4 g/kg lowered blood glucose levels in white rat (Rattus norvegicus) that have been made diabetic by giving alloxan. The greater the dose of pumpkin flour, the greater the decrease in blood glucose levels. The results of this study are in accordance with a previous study conducted by Jin et al (2013), which states that pumpkin flour extract in alcohol 95% is hypoglycemic. The mechanism proposed is that pumpkin flour extract does not stimulate β cells on the island of Langerhans to increase insulin secretion, but restore the island of Langerhans, repair damaged islands or act as an insulin sensitizer to increase insulin activity by improving insulin sensitivity in target tissues such as liver, muscle and adipose tissue. Pumpkin polysaccharides can also play an important role in restoring liver function and glucose use.[6]

Pumpkin contains various biologically active components, such as polysaccharides, paraaminobenzoic acid, fixed oils, sterols, proteins, peptides, carotenoids, gninobutyric acid and vitamins (Murkovic et al., 2002).

Pumpkin has antioxidant activity. Antioxidants are substances that protect membrane cells and other components of organisms against damage caused by oxidants. These compounds function by collecting free radicals, transferring electrons to them and ultimately making them inactive.[7]

Therefore, the protective effect of pumpkin pancreas and its hypoglycemic properties are caused, in part, by the antioxidant activity of this fruit. Abdel-Hassan et al. (2000) found that saponins extracted from Cucurbitaceae had high anti-diabetic activity. Flavonoid compounds, including quercetin with antioxidant activity also have a hypoglycemic effect in diabetic rats.[8] In addition, the presence of pectin itself can function as a hypoglycemic agent in pumpkin.[9]

In addition, the protective effect of PP on island cells damaged by STZ is through increased levels of SOD and MDA and reduced production of nireogen oxide (NO). PP inhibits apoptosis in damaged STZ island cells through modulating Bax/Bcl-2 expression. Given the significant protective effect of PP on small island cells, we suspect it will potentially improve the therapy of diabetes mellitus, which is used as a functional and nutraceutical food ingredient.[5]

The apoptotic signal meets the common cell death pathway, where caspase carries out apoptosis and the Bcl-2 family protein regulates it. There are two classes of regulatory proteins in the Bcl-2 family that support the opposite effect of apoptosis: anti-apoptotic members include Bcl-2 and Bcl-xL which protect cells against some forms of apoptosis, and pro-apoptotic members include Bax, tubs, and Bcl- xs that promote programmed cell death. The balance between pro-and anti-apoptotic signals from this family has a central role in the release of cytochrome C and its main consequences.[5]

In the diabetes model, regulation of decreased bcl-2 expression has been demonstrated. To further explain the protective effect of polysaccharides on pumpkin (pumpkin polysacharide = PP) and its mechanism, the effects of STZ and PP-1 on bcl-2 mRNA expression on Langerhans island cells were tested. The results showed that bcl-2 mRNA expression in Langerhans islet cells treated with streptozotocin (STZ) decreased, implying that bcl-2 was involved in the β cell apoptosis process induced by STZ. Pumpkin polysaccharides play the role of antiapoptosis by increasing the level of bcl-2 mRNA on Langerhans island cells.

Bax protein is a member of the Bcl-2 family that increases apoptosis. In previous studies it was found that bax mRNA expression was higher in the diabetes model. The study further proved that bax overexpression in Langerhans island cells treated (STZ) occurred, indicating that bax was responsible for the development of apoptosis of injured island cells. The role of pumpkin polysaccharides can reduce bax mRNA expression to protect island cells from damage to STZ.[5]

In this study, pumpkin was made flour, in the hope that it could later be used as nutrasetikal. Pumpkin flour is made a solution with the help of carboxymethylcellulose (cmc = carboxymethyl cellulose) then given to the sab diabetic model so that the dose is measured. The results of this study indicate that there was a decrease in blood glucose levels in the group of rats given yellow pumpkin flour for 21 days, the largest decrease occurred in the group with a dose of 4 grams/kg. The decrease in blood glucose levels is comparable to the glibenclamide dose of 0.45 mg/kg ($p > 0.05$), and but has not reached normal blood glucose levels ($p < 0.05$).

The results of testing the antioxidant activity in this study indicate that the administration of pumpkin flour can reduce the activity of AST and ALT enzymes. The AST and ALT enzymes are liver intracellular enzymes. In the diabetic model there is an increase in the levels

of AST and ALT enzymes due to the administration of alloxan which is also produced to be hepatotoxic resulting in liver cell damage. The decrease in the activity of these two enzymes shows that there is a mechanism for protecting liver cells from oxidative damage by alloxan.

The results of this study also showed a decrease in malondialdehyde levels in model rats given pumpkin flour. This shows the antioxidant activity in pumpkin. Malondialdehyde is one of the lipid peroxidation products. Lipid peroxidation is greatly increased in diabetic conditions because of an increase in free radicals. In alloxane-induced diabetic model rats also increase malondialdehyde levels because alloxane produces free radicals which subsequently occur lipid peroxidation to produce malondialdehyde.

These results are in accordance with the study conducted by Sopan et al. (2014) showed that Cucurbita maxima (pumpkin) flour contained phenolic compounds. This phenolic compound has many hydroxyl groups including ortho-hydroxy groups which have very strong antioxidant potential.[10]

Conclusion

Pumpkin flour has a hypoglycemic effect that is lowering blood glucose levels in diabetic mice, at a dose of 4 grams/kg BW equivalent to 0.45 mg/kg BB Glibenclamide, has antioxidant activity by reducing the enzyme activity of AST and ALT in diabetic mice ($p < 0.05$) and reduce malondialdehyde levels in diabetic mice ($p < 0.05$).Subsequent research can examine pancreatic cells to find out the mechanism of blood glucose reduction, whether through its effects on pancreatic beta cell repair, further investigating the effects of improvement on lipid profiles in diabetic conditions.

Ethical Clearance: Taken from Ethical commission Poltekkes Kemenkes (Health Polytechnic of Ministry of Health) Yogyakarta with number LB.01.01/KE-02/VIII/120/2017 (28 February 2017).

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Conflict of Interest: All authors state that there is no conflict of interest.

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Association of Diabetes Mellitus and Estrogen Hormone Levels with Vaginal Candidiasis

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Abstract

Objectives: The aim of this study was to investigate the association of diabetes mellitus and estrogen hormone levels with vaginal candidiasis.

Method: A cross sectional comparative study was used on 2018 from women of childbearing age (20-35 years) and one-year oral contraceptive who came to the obstetric polyclinic who conducted visual inspection with acetic acid (VIA) in Bhayangkara Hospital Polyclinic, Padang Pasir and Nanggalo Primary Health Care Padang City, West Sumatera Province, Indonesia. We recruited 58 respondents with consecutive sampling technique. Vaginal candidiasis was measured using vaginal secretions and microscopic laboratory test. Diabetes mellitus was measured using fast blood glucose and estrogen hormone levels measured with blood sample analysis using Enzyme-Linked Immunosorbent Assays (ELISA). Chi-square test and independent sample T test were used to data analysis, P value < 0.05 was considered as statistically significant association. Data were processed using IBM SPSS Statistics 24.0.

Results: Diabetes mellitus was associated with vaginal candidiasis ($p<0.05$). There was statistically significant mean difference of estrogen hormone levels with vaginal candidiasis, estrogen hormone levels with vaginal candidiasis were 143.39 pg/ml higher than not vaginal candidiasis were 60.99 pg/ml.

Conclusion: This analysis confirmed association of diabetes mellitus and estrogen hormone levels with vaginal candidiasis.

Keywords: *Candida albicans, diabetes mellitus, estrogen hormone, vaginal candidiasis.*

Introduction

One of the reproductive tract infections in women is vaginalis candidiasis. It is estimated 80-that 90% candidiasis vaginalis was caused by *C. Albicans*.[1] Prevalence of vaginal candidiasis in Indonesia estimated 25% -50%, bacterial vaginosis 20%-40% and trichomoniasis 5% -15%.[2]

C.albicans is a normal flora in some areas of the human body and an oppurtunistic pathogenic yeast. *C.albicans* can be a pathogen if there are predisposing factors, one of which is diabetes mellitus (DM). DM patients have a higher risk of developing candidiasis vaginalis. This is because high blood glucose levels cause elevated skin glucose levels in DM patients, thereby facilitating the appearance of skin manifestations in the form of dermatitis, bacterial infections and fungal infections. The increased blood levels in the blood and urine will make it easier for *C.albicans* infections to use blood glucose as a nutrient for growth.[3,4]

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Under normal conditions women has *C. Albicans* yeast on their bodies but are not aware because it is a harmless condition. One of the reasons why this *C. Albicans* can growth on the intimate part of a woman is because it contains glycogen which can support the life of fungi such as *C. Albicans*. The hormone estrogen is a hormone that is responsible against the appearance of *C. Albicans*. These hormones can trigger the vagina to produce more glycogen and support the growth of albicans candida fungi. This occurs because high levels of estrogen can affect vaginal susceptibility to infection by modulation of protective immune mechanisms such as decreased phagocytic cell activity such as neutrophils, macrophage cells and also natural killer (NK) cells.[5,6]

This study was held to determine the association of diabetes mellitus and estrogen hormone levels with vaginal candidiasis.

Method

Study design and research sample: This research was quantitative which conducted by using a cross sectional comparative study was used on 2018 from women of childbearing age (20-35 years) and one-year oral contraceptive who came to the obstetric polyclinic who conducted visual inspection with acetic acid (VIA) in Bhayangkara Hospital Polyclinic, Padang Pasir and Nanggalo Primary Health Care Padang City, West Sumatera Province, Indonesia. We recruited 58 respondents with consecutive sampling technique.

Operational definitions: The variables of this study divided into two independent variables, that are diabetes mellitus and estrogen hormone levels; and a dependent variable, that is vaginal candidiasis.

Ethics statement: The study was approved by the ethical committee board of Faculty of Medicine Universitas Andalas, Padang City, Indonesia Number 493/KEP/FK/2017. Written informed consent was obtained from all respondents.

Data collection technique: Vaginal candidiasis was measured using *vaginal secretions and* microscopic laboratory test. Diabetes mellitus was measured using fast blood glucose and estrogen hormone levels measured with blood sample analysis using Enzyme-Linked Immunosorbent Assays (ELISA).

Data Analysis: Chi-square test and independent sample T test were used to data analysis, P value < 0.05 was considered as statistically significant association. Data were processed using IBM SPSS Statistics 24.0.

Results

Data characteristics of the respondents (Table 1).

Table 1. Characteristics of the respondents

Characteristics	Vaginal candidiasis (n=29)	Not Vaginal candidiasis (n=29)
Age (Years), (mean±SD)	36.48 ±5.89	36.34 ± 5.62
Weight (Kg), (mean±SD)	57.31 ± 6.14	58,41 ± 8.29
Education level, (f/%)		
Low	6 (20.6)	4 (13.7)
Moderate	18 (62.2)	22 (76.0)
High	5 (17.2)	3 (10.3)

The mean age of respondents with vaginal candidiasis were 36.48 ±5.89 years and 36.34 ± 5.62 years with not vaginal candidiasis. Weight of respondents with vaginal candidiasis were 57.31 ± 6.14 Kg and 58,41 ± 8.29 Kg with not vaginal candidiasis. More than half of respondents have moderate level education between two groups.

Based on the results of examination of vaginal secretions in the laboratory can be seen the results of identification of *C. Albicans* (Figure 1).

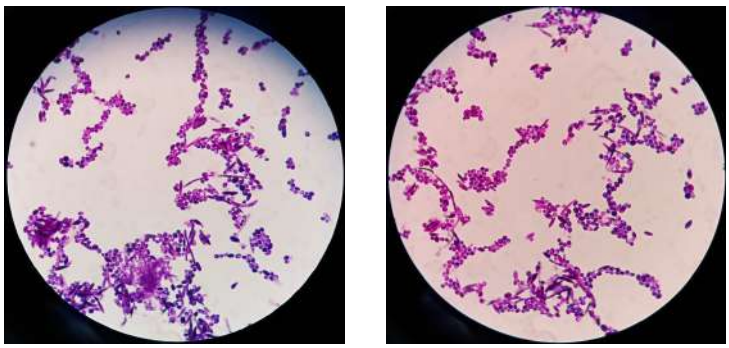

Figure 1. Identification of C. Albicans

Figure 1 showed *C. albicans* is dimorphic, producing yeast and pseudohifa.

The association of diabetes mellitus with vaginal candidiasis (Table 2).

Table 2. The association of diabetes mellitus with vaginal candidiasis

Diabetes mellitus	Vaginal candidiasis (f/%) (n=29)	Not vaginal candidiasis (f/%) (n=29)	Total	p-value
Diabetes mellitus	15 (51.7)	2 (6.9)	17 (29.3)	0.001
Not diabetes mellitus	14 (48.3)	27 (93.1)	41 (70.7)	
Total	29 (100.0)	29 (100.0)	58 (100.0)	

Table 2 known respondents with vaginal candidiasis from diabetes mellitus (51.7%) were slightly more than not diabetes mellitus (48.3%), diabetes mellitus was associated with vaginal candidiasis ($p<0.05$).

Mean difference of estrogen hormone levels with vaginal candidiasis (Figure 2).

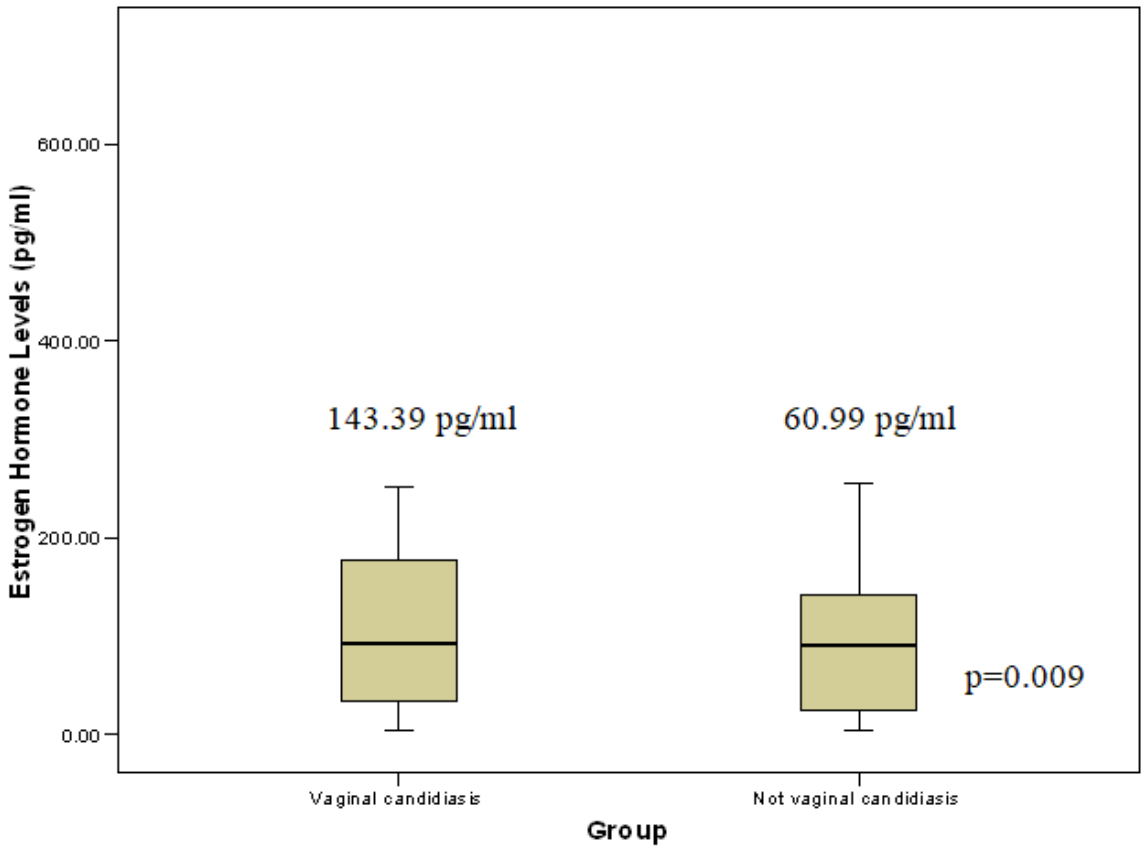

Figure 2. Mean difference of estrogen hormone levels with vaginal candidiasis

Figure 2 known there was statistically significant mean difference between estrogen hormone levels with vaginal candidiasis, estrogen hormone levels with vaginal candidiasis were 143.39 pg/ml higher than not vaginal candidiasis were 60.99 pg/ml.

Discussion

The results showed diabetes mellitus was associated with vaginal candidiasis ($p<0.05$). There was statistically significant mean difference of estrogen hormone levels

with vaginal candidiasis, estrogen hormone levels with vaginal candidiasis were 143.39 pg/ml higher than not vaginal candidiasis were 60.99 pg/ml.

Previous study known diabetes mellitus was associated with occurrence of candidiasis vaginalis ($p<0.05$).[7] Another study known the frequency of *C. albicans* higher in diabetic patients compared to non-diabetes.[8] Women with diabetes mellitus have a higher candidiasis vaginalis risk. This is because high blood glucose levels cause elevated skin glucose levels in DM patients, thereby facilitating the appearance of skin manifestations in the form of dermatitis, bacterial infections and fungal infections. The increased blood levels in the blood and urine will make it easier for *C.albicans* infections to use blood glucose as a nutrient for growth. Candida colonization increases with increasing blood glucose levels. Hyperglycemia can also cause the movement of neutrophils and monocytes to be slower and the ability of phagocytes to decrease. This resulted in increased Candida colonization.[3,4]

Increasing estrogen hormone levels can increase candidiasis vaginalis risk.[9] Estrogen levels higher in women with candidiasis vaginalis were 120.15 pg/ml compared to without candidiasis vaginalis 90.5 pg/ml.[10]

One of the reasons why this *C. Albicans* can growth on the intimate part of a woman is because it contains glycogen which can support the life of fungi such as *C. Albicans*. The hormone estrogen is a hormone that is responsible against the appearance of *C. Albicans*. These hormones can trigger the vagina to produce more glycogen and support the growth of albicans candida fungi. This occurs because high levels of estrogen can affect vaginal susceptibility to infection by modulation of protective immune mechanisms such as decreased phagocytic cell activity such as neutrophils, macrophage cells and also natural killer (NK) cells. Increased estrogen levels cause the vaginal epithelium to thicken and its surface coated with glycoproteins. This high glycogen level in the vagina is a good source of carbon for Candida growth so that the Candida fungus can thrive and multiply into pathogens.[5,6,11]

Conclusion

This analysis confirmed association of diabetes mellitus and estrogen hormone levels with vaginal candidiasis. The results of this study recommend the need to maintain blood glucose levels and use long-term contraception as well as the need for education and counseling.

Conflict of Interest Statement: The authors declared no potential conflicts of interest

Funding: Not applicable.

Ethical Clearance: The study was approved by the ethical committee board of Faculty of Medicine Universitas Andalas, Padang City, Indonesia Number 493/KEP/FK/2017. Written informed consent was obtained from all respondents.

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P24 Antigen Quantification of Indonesian Patients Infected with HIV-1 CRF01_AE

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Abstract

Introduction: HIV pandemic remains a global health problem. In Southeast Asia, including Indonesia, CRF01_AE dominates the pandemic. WHO recommended viral load test to monitor patient's response to ART. However, the application of viral load assays are difficult in resource-limited settings. Several researches suggesting the use of p24 antigen assay as an alternative to viral load test, since the p24 antigen concentration was shown to exhibit linearity towards viral load.

Objective: This research aimed to quantify p24 antigen concentration in HIV-positive patients living in Bali Province, Indonesia.

Materials and Method: Fifty plasma samples collected from HIV-positive patients infected with CRF01_AE were subjected to standard, non-modified ELISA to quantify p24 antigen concentration.

Results: Detectable p24 antigen concentration was found in 11 samples (22%). Unlike viral load, no correlation found between p24 antigen concentration with ART status and length of therapy (p>0.05).

Conclusion: The result suggested that p24 antigen quantification might not always reflect viral load, especially in patients infected with CRF01_AE. Employment of standard ELISA without any modification might be having lower sensitivity in quantifying p24 antigen concentration in HIV-positive patients, either ART naive or treated patients.

Keywords: *HIV-1, CRF01_AE, p24 antigen, HIV-positive, Indonesia.*

Introduction

The number of new HIV infections globally continues to decline, but the progress is far slower in order to reach the 2020 milestone. As the HIV pandemic remains a global health problem, around 36.9 million people were reported to be living with HIV in 2017.[1] Indonesia reported 280,623 cumulative cases of HIV in the same year. Jakarta, East Java, Papua, West Java, Central Java, and Bali were the provinces with highest cumulative HIV infection and AIDS cases.[2]

The HIV pandemic exhibits extraordinary global genetic diversity. The spread and evolution of HIV has caused differential distributions of HIV-1 subtypes, circulating recombinant forms (CRFs), and unique recombinant forms (URFs) worldwide.[3] In Southeast Asia, CRF01_AE accounted for 72.8% HIV-1 infection from 2010 to 2015.[4] Indonesia, as a Southeast Asian country, was also dominated by CRF01_AE infection. The recombinant known to be pandemic in several Indonesian regions including Surabaya, West Papua, Riau, Manado, and Bali.[5-9]

The World Health Organization (WHO) recommended antiretroviral therapy (ART) to be offered

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to all adults living with HIV, regardless of WHO clinical stage and at any CD4 cell count. Since 2013, WHO has also recommended viral load monitoring as the preferred approach to monitor patient's response to ART.[10] However, viral load assays require expensive equipment and reagents ($ 50–100 per test in the US), well-trained operators, and established laboratory infrastructure.[11-12] In resource-limited settings where people are most afflicted with the HIV-1 epidemic, the requirements might not be fulfilled, restricting in difficulty to implement viral load assay.[11]

There are several researches suggesting the use of p24 antigen assay as an alternative to viral load test. The assay employed a standard ELISA (enzyme-linked immunosorbent assay) format for the capture and detection of HIV-1 p24 antigens coupled with a specific amplification process to increase the assay sensitivity.[12] p24 antigen quantification shown a comparable sensitivity and parallel results towards viral load, both in subtype B and non-subtype B samples. The p24 antigen concentration was shown to exhibit linearity towards viral load.[13-15]

Previous researches were conducted mostly using samples from Europe, United States of America (USA), and Africa, but no samples were from Asia, especially Southeast Asia where most infection caused by CRF01_AE. This research aim to quantify p24 antigen concentration of HIV-infected patients, either ART naive or treated, living in Bali, Indonesia, which known as a region dominated by CRF01_AE infection.[8]

Material and Method

Sample Collection and p24 Antigen Quantification: HIV-infected individuals enrolling in drug resistance testing were recruited from the Voluntary Counselling and Testing Clinic of Buleleng Regency General Hospital, Bali. Patients with previous genotyping result showing HIV-1 CRF01_AE infection were eligible for this study. Fifty participants were included in this study. Five millilitre of ethylenediaminetetraacetic acid (EDTA) peripheral blood samples were collected from participants, with written informed consent were obtained from each participant prior to the procedure. Demographic and clinical data of study participants were retrieved from the medical records. Plasma was isolated from the blood samples using centrifugation. Quantification of p24 antigen was performed by subjecting the plasma samples to standard ELISA assay using RETRO-TEK HIV-1 p24 Antigen ELISA (Zeptometrix, New York, USA).

Stastitical Analysis: Stastitical analysis were performed with a minimum significance level of p=0.05. Descriptive analysis were performed towards demographic and p24 antigen quantification result. Differences p24 antigen concentration between sex group were analyzed using Fisher's Exact Test, while correlation between age, treatment status, and length of treatment with p24 antigen concentration were analyzed using Spearman correlation.

Results

Fifty patients enrolled in this study were comprised of 18 ART naïve and 32 treated patients. Eleven patients were treated less than or equal to six months, while 21 others were treated for more than six months. No patient has any history of treatment dropout or treatment interruption.

Quantification results showed that six ART naive and five treated patients have detectable p24 antigen concentration; 10 among them were having p24 antigen concentration >0 - 7.8 pg/mL and one with p24 antigen concentration >31.3 - 62.5 pg/mL. p24 antigen concentration was correlated neither to sex (p=0.085) and age (p=0.075), nor to treatment status (p=0.153) and length of ART (p=0.065). Demographic and clinical data of study participants as well as p24 antigen are shown in Table 1.

The production and release of p24 and particle-associated RNA are biologically linked, as both are derived from unspliced viral mRNA. p24 is an important structural component of the retroviral particle. Increasing viral transcription will normally lead to increased intracellular concentrations of both genomic RNA and viral proteins, which will be followed by increased particle formation and release, leading to increased extracellular concentrations of the two markers. In the natural course of HIV infection, viral RNA and p24 antigen concentration are expected to be linear.[16] Based on this theory, several researches suggested the use of p24 antigen assay as a substitute to viral load test.[13-17]

Those research employed ultrasensitive p24 Antigen Assay by PerkinElmer Life and Analytical Sciences.[12] The ultrasensitive p24 (Ultra p24) antigen assay uses a standard ELISA format for the capture and

detection of HIV-1 p24 antigens, and can be coupled with modifications, including the use of a more efficient virus lysis buffer and tyramide signal amplification for increased sensitivity to improved the p24 antigen assay.[12,16] Heat denaturation of the plasma prior to binding of p24 antigen in the ELISA step helps dissociate immune complexes and denature the antibodies which usually binds to the p24 antigen.[12]

Schupbach et al. reported that the HIV-1 p24 antigen and HIV-1 RNA typically decreases in parallel in successfully treated patients with subtype B infection. The p24 antigen also reported to be a good prognostic indicator of disease progression.[13] Pascual et al. Compared the results of Roche RNA assay to the ultrasensitive p24 antigen assay kit in 130 patients from the US and Malawi. Although RNA assay was more sensitive compared to the ultrasensitive p24 antigen assay (95.4% vs 84.6%, respectively), the results are comparable. Ultrasensitive p24 antigen assay detected 87% of specimens with viral loads between 10,000 and 100,000 copies/ml and 97.7% of specimens with viral load greater than 100,000 copies/ml. Asides from patients' specimen, ultrasensitive p24 antigen assay was also able to recognize isolates representing subtype A to F.[17]

Similar results were observed in Burkina Faso where the antigen assay detected 80% and 87% of samples with viral loads 1000–63,000 and >80,000 copies/mL, respectively.[14] Ribas et al. evaluated 40 treated patients infected with HIV-1 group M (subtype A-K, CRF01_AE, and several other recombinants) and group O. Results showed that among 33 patients, the p24 antigen correlated well with RNA results. The heat-denatured p24 antigen assay was capable of measuring the plasma level of p24 derived from all the HIV-1 subtypes and recombinants selected for the study, in contrast to the viral load test which lacked sensitivity towards HIV-1 group O.[15] As a remark, these researches concluded the p24 antigen assay as a reliable, sensitive and a more affordable tool that can be used for the follow-up of patients infected with B and non-B subtypes as well as recombinant forms in resource limited settings.[13-18]

However, the results of this study could not support those previous findings. After initiation of antiretroviral therapy, the plasma viral load usually decreases to concentrations below the lower limit of detection of available commercial assays within 3 months;[18] thus, p24 antigen concentration is supposed to be higher in ART naive patients compared to those of treated patients. This study found no correlation between treatment status (p=0.153) and length of ART (p=0.065) to the concentration of p24 antigen.

Among 50 samples, detectable p24 antigen concentration was found in 11 samples (22%), which comprised of six ART-naive patients, three patients treated ≤6 months, and two patients treated >6 months. Although statistically insignificant, the number of ART-naive patient with detectable p24 antigen is higher than the groups of treated patient. Highest detectable p24 antigen concentration (>31.3 - 62.5 pg/mL) also detected in ART-naive patient. These results suggested the possibility of p24 antigen concentration reflecting higher viral load in ART-naive patient compared to treated patient.

Most samples were found to have undetectable p24 antigen concentration. This might be due to lower sensitivity of standard, non-modified ELISA, in quantifying p24 antigen concentration. Modification to ELISA steps, such as heat denaturation and tyramide signal amplification, known to increase sensitivity of the p24 antigen assay.[12.16]

The results of this study might be more consistant to those of Prado et al. and Bonard et al., which found that p24 antigen assay not always reflect viral load in all samples. Prado et al. found little correlation between HIV-1 RNA and p24 antigen concentration. In the study, 76% of the treated patients and 49% of the naïve patients showed discordance between HIV-1 RNA detection and p24 detection after viral rebound.[19] p24 antigen in Plasma specimens from 14 patients in Côte d'Ivoire also found only slightly mirror the HIV RNA. p24 antigen in patients treated with highly active antiretroviral therapy shown weaker changes during treatment compared to the HIV-1 RNA results. Among seven patients failing ART, only three had p24 antigen results similar to RNA results.[20]

Table 1: Demographic and clinical data of study participants and p24 antigen concentration

Characteristics	n	Undetectable	>0 - 7.8 pg/mL	>31.3 - 62.5 pg/mL	P value
Sex					
Male	28	19	8	1	0.085[a]
Female	22	20	2		
Age (Years)					
20-29	13	11	2		
30-39	19	15	4		0.075[b]
40-49	10	9	1		
50-59	1	1	0		
ART Status					
Naïve	18	12	5	1	0.153[b]
Treated	32	27	5		
Length of ART					
Naive	18	12	5	1	0.065[b]
≤ 6 months	11	8	3		
> 6 months	21	19	2		

[a]Fisher's exact test; [b]Spearman test

Conclusion

In summary, this research suggested that the result of p24 antigen quantification might not always reflect viral load, especially in CRF01_AE infected patients. Employment of standard, non-modified ELISA, might be having lower sensitivity in quantifying p24 antigen concentration in both ART naive and treated patients, if compared to modified ELISA with heat denaturation and tyramide signal amplification.

Conflict of Interest: Authors declare no competing interests exist.

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Ethical Clearance: Ethical approval for this research was obtained from Ethics and Law Committee of Universitas Airlangga Hospital (Ethical approval no. 033/KEH/2016).

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Effect of Black Seed (Nigella Sativa) Extract on Release of Some Minerals from Human Enamel: An in Vitro Study

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Abstract

Background: Black seed of *Nigella sativa* has been used for centuries to promote health due to its anti-microbial, anti-oxidant and anti-inflammatory effects. This study was conducted to evaluate the ability of black seed water extract to reduce the release of potassium and zinc ions from enamel after acidic attack.

Materials and Method: Twenty five maxillary human premolars were prepared and divided into five groups. The test solutions were included, black seed water extract in three concentrations (3%, 5% % and 7%), sodium fluoride (0.05%) as control positive and de-ionized water as control negative. The teeth in each group were immersed separately in 40 ml of the test solution for two minutes, once daily and for twenty days. The teeth then prepared for subsequent etching and analysis by atomic flame spectrometer to measure the concentration of the released potassium and zinc ions.

Result: The highest mean value of dissolved potassium ion was found in de-ionized water group followed by 3% water extract of black seed while the lowest one was recorded in 7% black seed water extract. The statistical difference between the five groups was highly significant ($p<0.01$) by using ANOVA test. The highest mean value of dissolved zinc ion was found in de-ionized water group followed by 0.05% sodium fluoride and 3% black seed extract while the lowest one was recorded in 7% water extract of black seed. The statistical difference between the five groups was also highly significant ($p<0.01$).

Conclusion: Water extract of black seed has the ability to reduce the dissolution of potassium and zinc ions from the tooth and might increase tooth resistance against acid attack.

Keywords: *Nigella Sativa, potassium ion, zinc ion.*

Introduction

There is a worldwide increasing interest on the use of herbs or plants in the treatment of various diseases especially in developing countries. Black seed of *Nigella sativa*is an annual flowering plant that widely used in nutrition and medicine. This seedis rich in phenolic compounds, essential fatty acids, proteinsand bioactive compounds[(1)]. Previous studies had searched for its anti-oxidant, anti-cancer, anti-inflammatory and anti-microbial activities of this miracle seed[(2,3,4)].

Enamel is the hardest tissue in the human body. Dental enamel is 95% mineral, 4% water and 1% organic matter by weight percentage. The minerals are composed mainly from calcium and phosphate in addition to the presence of small quantities of other elements[(5)]. Zinc is essential trace element. It accumulates in the surface structures of teeth and occurs in low concentrations in subsurface material. Zinc can reduce enamel demineralization and increase enamel resistance to acid dissolution[(6)]. Regarding potassium ion, enamel content of this ion is very low in comparison with calcium and phosphors contents [(7)]. However, little data are available about the relation between tooth resistant to acid attack and potassium content. A possible relationship between enamel minerals content and caries susceptibility has been advised[(8)]. No previous study was conducted for the effect of water extract of *Nigella sativa* on the release of zinc and potassium ions from human enamel, so this study was conducted.

Materials and Method

Extracted maxillary first premolar teeth from patients aged 10-13 years old were selected from orthodontic department (college of dentistry, university of Baghdad). The total number of teeth was 25. The teeth were cleaned by using conventional hand piece and rubber cup with non-fluoridated pumice and deionized water. After cleaning, the teeth were stored in 0.1% thymol solution at 4º C until use tominimize microbial growth. This step also was done to prevent the dryness and brittleness of teeth. The water extract of black seed was prepared by the modified method of Ibraheem et al[9]. The teeth were divided into five equal groups; each group consisted of five teeth. The test solutions were included, water extract of black seed in three concentrations (3%, 5% % and 7%),sodium fluoride (0.05%) as control positive and de-ionized water as control negative. The teeth in each group were immersed separately for two minutes, once daily,for twenty days in 40 ml of the test solution. After each immersion, the specimens were washed in de-ionized water for 5 minutes and then stored in de-ionized water with thymol (0.1%)at room temperature till the next immersion.

After the treatment period (20 days), a rounded area (3 mm in diameter) were prepared on buccal surface of each tooth by applying adhesive disc and avoiding hypo plastic areas ormicroscopic cracks. The rest of enamel for each tooth was covered by a sticky wax, leaving only the rounded area (window) exposed for subsequent etching. The windows were etched for ten seconds in separated polyethylene tubes. Eachtube is containing five ml of 2NHCL[10]. The concentrations of released potassium and zinc ions were determined calorimetrically by using flame atomic absorption spectrometer.

Statistical analysis: The data was processed using SPSS version 20 statistical software. Means and standard deviation were calculated for each group. One way ANOVA and Dunnett T3 (post hoc test) were used to evaluate the significance of difference between the five groups. Probability values less than 0.05 were considered statistically significant (P<0.05). Values less than 0.01 were considered highly significant (P<0.01).

Results

Concentration of potassium ion release (mean,standard deviation and statistical analysis of ANOVA are illustrated in Table 1.The highest mean value of dissolved potassium ions was found in de-ionized water group followed by 3% water extract of black seed while the lowest mean was recorded in 7% concentration of black seed. The statistical difference between the five groups was highly significant (p<0.01). Table 2 is showing the mean differences of dissolved potassium ions concentrations between each two agents. No statistical significant differences were found between the de-ionized water and black seed extract in concentrations: 3%, 5% and 0.05% of sodium fluoride. No significant difference was found between 5% black seed extract and 0.05% sodium fluoride.

Concentration of zinc ion release (mean, standard deviation and statistical analysis of ANOVA are illustrated in Table 3. The highest mean value of dissolved zinc ion was found in de-ionized water group followed by 0.05% sodium fluoride and black seed extract 3%, while the lowest mean was recorded in water extract of black seed 7%. The statistical difference between the five groups was highly significant (p<0.01).Table 4 is showing statistical mean differences of dissolved zinc ions concentrations between each two agents. No statistical significant difference was found between the black seed extract in 5% and 7%. No significant difference was found between 3% black seed extract and 0.05% sodium fluoride.

Table 1: The released potassium ion concentrations among the selected agents

Selected Agents	No	Mean ± SD	F value	P value
Water black seed extract 3%	5	0.910±0.07	19.44	0.00**
Water black seed extract 5%	5	0.660±0.07		
Water black seed extract 7%	5	0.484±0.06		
Sodium Fluoride 0.05%	5	0.730±0.05		
Deionized water	5	1.634±0.48		

** Highly significant (p<0.01), df (Between Groups=4, Within Groups=20, Total=24)

Table 2: Post hoc test between each two agents (potassium ion concentrations)

Agent 1	Agent 2	Mean Difference	Significant
Water black seedextract 3%	Water black seed extract 5%	0.250**	0.005
	Water black seed extract 7%	0.426**	0.000
	Sodium Fluoride 0.05%	0.180*	0.022
	Deionized water	-0.724	0.159
Water blackseed extract5%	Water black seed extract 7%	0.176*	0.027
	Sodium Fluoride 0.05	-0.070	0.573
	Deionized water	-0.974	0.063
Water blackseed extract 7%	Sodium Fluoride 0.05	-0.246**	0.002
	Deionized water	-1.150*	0.035
SodiumFluoride0.05%	Deionized water	-0.904	0.081

*The mean difference is significant at the 0.05 level., ** The mean difference is highly significant at the 0.01 level.

Table 3: The released zinc ion concentrations among the selected agents

Selected agents	No	Mean ± SD	F value	P value
Water black seed extract 3%	5	4.6260±0.30	168.547	0.00**
Water black seed extract 5%	5	3.3240±0.28		
Water black seed extract 7%	5	2.7760±0.29		
Sodium Fluoride 0.05%	5	4.7260±0.45		
Deionized water	5	8.6140±0.54		

**Highly Significant (p<0.01), df (Between Groups=4, Within Groups=20, Total=24)

Table 4: Post hoc test between each two agents (zinc ionconcentrations)

Agent 1	Agent 2	Mean Difference	Significant
Water black seedextract3%	Water black seed extract 5%	1.302**	0.001
	Water black seed extract 7%	1.850**	0.000
	Sodium Fluoride 0.05	-0.100	1.000
	Deionized water	-3.988**	0.000
Water blackseed extract5%	Water black seed extract 7%	0.548	0.129
	Sodium Fluoride 0.05	-1.402**	0.006
	Deionized water	-5.290**	0.000
Water blackseed extract7%	Sodium Fluoride 0.05%	-1.950**	0.001
	Deionized water	-5.838**	0.000
SodiumFluoride0.05%	Deionized water	-3.888**	0.000

*The mean difference is significant at the 0.05 level., ** The mean difference is highly significant at the 0.01 level.

Discussion

In dentistry, the extract of black seed was tested in many studies to verify its oral effects due to the interested organic and inorganic constituents. The black seed showed its antimicrobial action against *Streptococcus mutans*, *Streptococcus mitis* and other types of bacteria isolated from the oral cavity [11,12]. In addition to that, *Nigella Sativa* extract had an obvious effect on the healing process of oral ulcer[13]. In previous Iraqi study, water extract of black seed was able to decrease the dissolution of inorganic phosphorous ions from teeth [14].In the current study, the water extract of black seed was tested in three concentrations to approve its ability to decrease the dissolution of zinc and potassium ions from the tooth surface and thus increase the hardness of the tooth and the resistant to acid attack. Sodium fluoride was used as control positive due to its effect in inhibiting

demineralization and enhancing remineralization of tooth surface. It is able to react with the outer enamel surface resulting in the formation of calcium fluoride[15].

The study showedthat the release of potassium ions was the least for the 7% extract and the highest release was recorded in deionized water group. The effect of sodium fluoride 0.05% in reducing the release of potassium ion was better than that reported for 3% extract.

The study also reported that the release of zinc ions was theleast for the 7% extract and the highestrelease was recorded in deionized water group. The effect of 3% extract was almost equal to the effect of sodium fluoride 0.05% in reducing the release of zinc ions. This may indicate that the application of black seed water extract can decrease the demineralizing effect of the acid used. It was alsoobvious from this study that, if theconcentration of the extract increases, theremineralizing effect of the water extract will increase. These results approve the findings of other studies regarding the effect of black seed water extract to improve the hardness of the tooth [14,16]. This effect could be attributed to thechemical composition of black seed and its mineralcontents (calcium, phosphorous, potassium, sodium, zinc and iron)which was reported by previous studies[17,18]. However, the finding of this study is needed to be confirmed byfurther investigations and larger sample sizebefore the applicationof this extract in the above mentioned concentration as mouth wash in preventive dentistry.

Conclusion

Water extract of black seed or *Nigella Sativa*has the ability to reduce the dissolution of potassium and zinc ions from the tooth.This effect might increase tooth hardness and its resistanceto acid attack.

Conflict of Interest: None

Funding: self

Ethical Clearance: Not required.

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Efficacy of Catharanthus Roseus Extract Against Dengue Virus Type 2 Infection in Vitro

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Abstract

Catharanthus roseus, known as Madagascar periwinkle is an herbal and traditional plant used for treatment of various diseases. A study was carried out to test the cytotoxicity and antiviral effects of methanol extract from the leaves of *C. roseus*. The leaves of *C. roseus* were extracted using methanol to produce crude methanol extract. *In vitro* cytotoxicity test was performed to determine the concentration value of the extract causing 50% cell death (CC_{50}) using MTT assay. The antiviral activity has been confirmed by conducting foci forming unit reduction assay (FFURA) which involved post-treatment, pre-treatment and virucidal tests. Cytotoxicity test was performed on Vero cells indicates the CC_{50} value for *C. roseus* extract towards Vero cells was 0.13 mg/mL. The 50% Effective Concentration, EC_{50} of *C. roseus* extract was 0.025 mg/mL. Selectivity index of *C. roseus* extract against DENV-2 was 5.2. Three treatments were used in the antiviral test; 1) post-treatment, 2) pre-treatment, and 3) virucidal. The results revealed that the post-treatment was more effective in inhibiting viral replication compared to pre-treatment and virucidal.The results of this research showed that *C. roseus* extract has good potential for prospective nature-based antiviral drug.

Keywords: *Catharanthus roseus, Antiviral Activity, Dengue Virus Type 2, MTT, FFURA.*

Introduction

In this study, we investigate the cytotoxicity and antiviral properties of *C. roseus* to explore its potential as anti-DENV-2 agent. *Catharanthus roseus* (L.) G. Don (Apocynaceae) a perennial herb plant is widely used as an ornamental species in many *tropical countries.* It is more commonly known as Madagascar periwinkle. In Malaysia its known as *Kemuningcina*. This plant produces a combination of pink, purple and white flowers. These flowers are often grown for their attractive appearance and to decorate shady areas[1]. Methanolextracts of *C. roseus* has been reported to exhibit significant anti-cancer activity against different cell types *in vitro*[2.] Crude extracts of *C. roseus* showed antibacterial activity against Gram-positive and Gram-negative bacteria[3]. In addition, *C. roseus* extract also showed antifungal properties against *A. fumigatus*, *C. albicans*, *A. niger* and *F. moniliforme*[4].

Dengue virus (DENV) is a positive-sense, single-stranded RNA virus with a genome size of at least 10.7 kb. It is a member of the Family Flaviviridae, genus Flavivirus. There are four different DENV serotypes (DENV-1, DENV-2, DENV-3, and DENV-4) which are primarily transmitted between humans by the mosquito vector*Aedes aegypti* and *Aedes albopictus*[5,6]. Dengue virus can cause asymptomatic infection to mild dengue fever or severe dengue hemorrhagic fever and dengue shock syndrome[7]. All DENV serotypes are widespread geographically throughout the tropics. The incidence of dengue has grown dramatically around the world in recent decades[8]. Recovery from infection by one serotype provides lifelong immunity against that particular serotype. However, cross-immunity to

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the other serotypes after recovery is only partial and temporary. Secondary infection by other serotypes increase the risk of developing severe dengue[9].

Materials and Method

Plant Material and Extraction: Leaves of *C. roseus* were washed under running tap water and finally rinsed with distilled water then air dried for 48h, homogenized into a fine powder and stored in air-tight plastic containers. Dried leaves were finely ground and then extracted in a soxhlet extractor using methanol solvent. After that, the extract was evaporated to dryness using a rotavap. Lastly, freeze dry technique was performed to lyophilize the extract.

Cell and virus: Vero cell from American Type Culture Collection (ATCC) CCL-81 was used for both cytotoxicity and antiviral test. Dulbecco's Modified Eagle's Medium (DMEM) supplemented with 5% fetal bovine serum (FBS)was used for Vero cell maintenance throughout the experiment. C6/36 cells maintained in L-15 medium supplemented with 5% FBS were used for virus propagation. Dengue virus type-2 (DENV-2) used in this study is a prototype of the New Guinea C strain, a kind gift from the Faculty of Biosciences and Medical Engineering, UniversitiTeknologi Malaysia. Briefly, the virus was propagated in C6/36 cells, harvested and the virus titer was determined by focus forming assay using Vero cells[10].

Cytotoxicity Test: Cytotoxicity of *C. roseus* extract against Vero cells was determined using the MTT assay[11]. Briefly, a confluent monolayer of Vero cells in 96-well cell culture microplate were treated with increasing concentrations of *C. roseus* extract triplicates with starting concentration of 10 mg/mL. After 48 h of incubation, 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide (MTT) was added into each well and was further incubated for 3 h. After removing excess MTT, 100 µL of dimethylsulfoxide (DMSO) was added. The absorbance values of the wells were measured at 570 nm using a 96-well plate reader. Dose-response curve was plotted using Graph Pad Prism 5 and the half maximal cytotoxic concentration (CC_{50}) of *C. roseus* extract was determined from the plot.

Foci forming unit reduction assay (FFURA): FFURA was done to screen for anti-DENV-2 activity of *C. roseus* extract with different concentrations. Infected Vero cells which were treated with *C. roseus* extract was incubated for 4 days post infection in growth medium supplemented with 2% FBS and 1.5% carboxymethyl cellulose. The number of DENV-2 foci was counted using a stereomicroscope and the virus titer was expressed as Foci Forming-Unit (FFU). Antiviral activities of the compounds were determined by calculating the percentage of foci reduction (% RF) compared against the controls using the following formula:

$$RF\ (\%) = (C\text{-}T) \times 100/C$$

where, C is the mean of the number of foci from triplicates treatment without extract added and T is the mean of the number of foci from triplicates of each treatment measures with the extract[12].

Antiviral Activity: Antiviral assays composed of post-treatment, pre-treatment and virucidal assays. **Pre-treatment:** In order to determine the prophylactic effects of *C. roseus* extract against DENV-2 replication, different concentrations of *C. roseus* were added to the confluent Vero cells (2.0×10^5 cell/well) in 12-wells microplate after 5 h of virus infection. The treatment medium was removed and the treated cells were washed twice with PBS. The cells were then infected with 200 FFU of DENV-2 and incubated at 37°C for 4 days, 5% CO_2. After 4 days of infection, antiviral activity was determined by the reduction in foci number as previously described. **Post-treatment assay:** Vero cells (2.0×10^5 cell/well) grown into 12 well plate were infected with 200 FFUof DENV-2. Cells were incubated for 1.5 h to allow virus adsorption. After adsorption period, cells were washed twice with PBS to remove any residual unbound viruses. This was followed by the addition of different concentrations of *C. roseus* extract. The cells were then infected with 200 FFU of DENV-2 and incubated at 37°C for 4 days in the presence of 5% CO_2. After 4 days of infection, antiviral activity was determined by the reduction in foci number as previously described. **Virucidal assay:** A viral suspension containing 200 FFUofDENV-2incubated with equal volume of the different concentrations of *C. roseus* extract for 1.5 h at 37°C. After incubation, all tubes were diluted and titrated. Then, Vero cells were infected with the diluted treated viral suspension. Cells were washed twice with PBS after 1.5 h adsorption at 37°C and cells were overlaid by 1.5% CMC containing DMEM supplemented with 2% FBS. After 4 days of incubation, direct virucidal activity of *C. roseus* extract was determined by foci reduction as previously described.

Statistical Analysis: Values were expressed as means ± standard errors of the mean. Significance

difference, determined as $P < 0.05$, was calculated using Student's t-test (Microsoft Excel).

Results and Discussion

To determine the nontoxic dose, Vero cells were exposed to twofold serially diluted *C. roseus* methanolextract at concentrations ranging from 1 to 0.03 mg/mL. In this assay, the CC_{50} value of *C. roseus* extract was determined at 0.13 mg/mL. Figure 1 shows the percentage of cell viability versus concentration of *C. roseus* extract. Thus, maximum concentration that was used in the subsequent antiviral studies was fixed at 0.078 mg/mL.

Figure 2 shows the result obtained from antiviral assays using *C. roseus* extract. In post-treatment assay, more than 60% foci reduction was observed in *C. roseus* extract at the highest concentration (0.078 mg/mL). The lowest concentration (0.005 mg/mL) of *C. roseus* extract still exhibited mild reduction which was more than 30%. The antiviral activity of *C. roseus* extract was observed to be concentration dependent as the percentage of foci reduction is reduced with reducing *C. roseus* extract concentration. For pre-treatment assay, *C. roseus* extract showed weak activity which was less than 2% foci reduction at highest concentration (0.078 mg/mL). In virucidal assays, exposure of DENV-2 to the *C. roseus* extract at highest concentration (0.078 mg/mL) reduced more than 30% of foci reduction. This result confirms the mild virucidal activity observed in *C. roseus* extract.

The EC_{50} value of the SPD tested against the DENV-2 was 0.025 EC_{50} (mg/mL), as shown in figure3. The effectiveness of the *C. roseus* as an anti-DENV-2 expressed as selectivity index (SI). *Catharanthus roseus* possessed a moderate anti-DENV-2 activity with SI value of 5.2. Any antimicrobial agent that has SI values higher than 10 (SI>10) ensures the potential to be developed as an agent of antiviral drug. Meanwhile, SI value less than 1 are considered to be weak antiviral agent. SI value above 1 have moderate activity as antiviral agent[13].

Catharanthus roseus is an important medicinal plant distributed all over the world. The interest in this plant are due to the reports thatmore than 130alkaloids and severalof them exhibit potent pharmacological propertiescan be found in *C. roseus*[14].Based on phytochemical analyses, *C. roseus*has been proven to be rich n secondary metabolites such as alkaloids, flavonoids, phenols, tannins, saponin, terpenoids, quinines and cardiac glycosides[15,16]. *Catharanthus roseus* have been reported by many researchers to be rich in alkaloid[17,18,19]. Alkaloid from *C. roseus* inhibited simplex herpes virus (type I) and showed an antiparasitic effect against Trypanosoma[20]. Flavonoids groups have been reported by several researchers to exhibit a wide range of biological activities such as antimicrobial, antioxidant, anti- analgesic, anti-inflammatory, anti-cancer and anti-allergic[21].There have been reports on flavonoids from plant inhibited dengue virus type -2 (DENV-2) in Vero cell via Foci Forming Unit Reduction Assay (FFURA)[22]. Flavonoids from *C. roseus* were found to cause maximum antimicrobial activity towards Gram positive and Gram negative bacteria[23]. Thus, the richness of alkaloid and flavonoid in *C. roseus* may contribute to anti-DENV-2 properties.

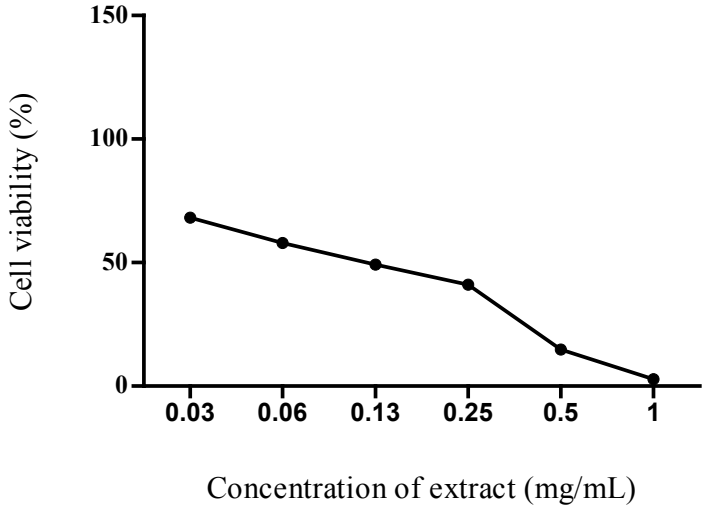

Fig. 1: Cytotoxicity assay of C. roseus extract against Vero cells. The results are presented as percentage of cell viability from triplicate assays.

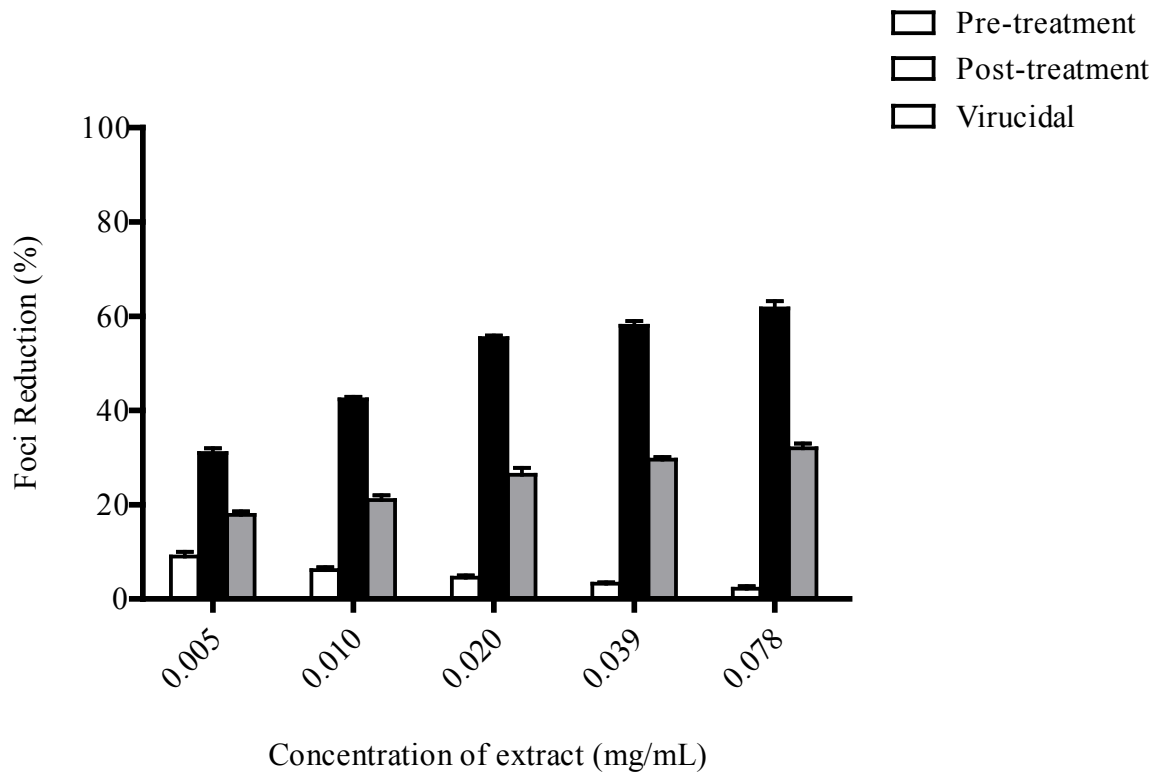

Fig. 2: Antiviral activities of C. roseus extract against HSV-1 via pre-treatment assay, post-treatment assay, and virucidal assay.

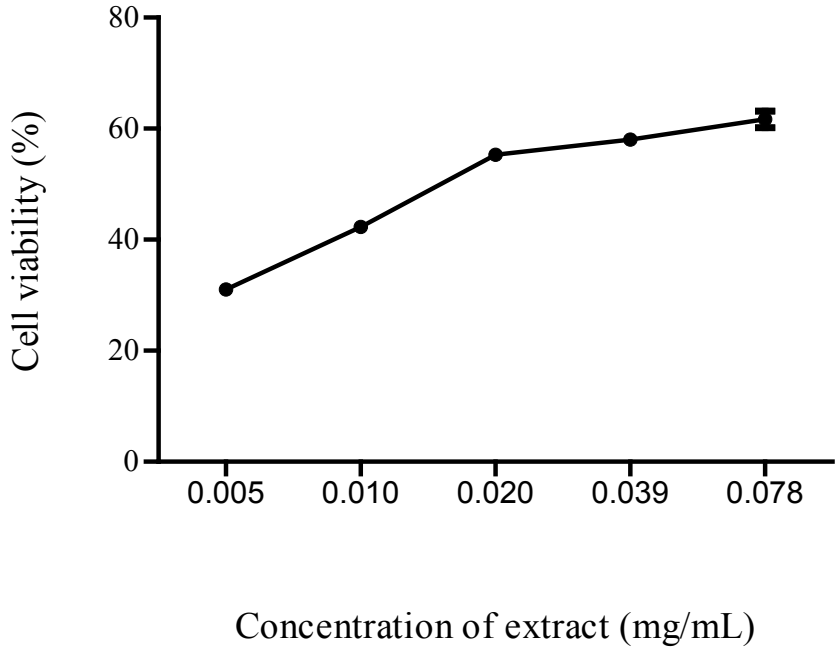

Fig. 3: Determination of Catharanthusroseus extract effective concentration (EC_{50}).

Conclusion

This study demonstrates the variable effects of *C. roseus* extract on DENV-2 replication in Vero cells. Extract had mild antiviral activities and low prophylactic function. In order to elucidate the mechanisms of inhibition, further studies are required to determine the underlying mechanisms that contribute to its antiviral activity.

Ethical Clearance: Nil

Source of Funding: University

Conflict of Interest: Nil

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Psychometric Evaluation of a Feedback Conception Scale: Building Positive Feedback Practises of Charge Nurses in Public Hospitals

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Abstract

Charge nurses who have a good level of understanding on feedback conceptions will be able to practise feedback effectively towards their staffs. The purpose of this pilot study was to provide the evidence of psychometric evaluation of 'Teachers' Conceptions of Feedback (TCoF) scale of charge nurses using the Rasch Measurement Model. There are 9 constructs with 37 items altogether. One hundred and sixty-three (N=163) charge nurses from three states had completed the questionnaire. The content validity was checked by three experts in the field of measurement and medical health. The findings revealed that most items fit the model as their MNSQ values are between 0.60 and 1.40 except for four items. PMC value for all items are more than 0.20 except for three items. Two items showed a negative value of PMC. Most items are in a same direction so the item discrimination is good. Item reliability and item separation is 0.87 and 7.29 respectively, while person reliability and person separation is 0.81 and 2.81 respectively. The reliability value for item and person is high and acceptable. The separation index for item and person are also acceptable. In total, five items were deleted. The statistical analysis provides strong evidence to support the validity and reliability of the scale. The findings show that sample selection is appropriate. Hence, this instrument could be adapted or adopted by other researchers in the Malaysian health care system context.

Keywords: *Charge nurse, feedback conceptions, validity, Rasch Measurement Model.*

Introduction

Feedback is one of the most influences on someone's achievement. Feedback, by definition is any information given to someone by teachers, peers, parents, books, self or experience in providing knowledge, skills and attitude[10]. What type of information are we talking about? It could be an alternative strategy, a clarification of ideas or the correctness of a response. Feedback can be accepted, modified or rejected[11]. And, feedback which is gained from learners could make teaching become more effective as it can be used to adjust teaching approaches[19]. On the other hand, feedback is incapable in reinforcing someone or initiating further action of someone. Feedback might threaten someone if the information given is not familiar or obtrusive to them. Before we go into detail, let us look at the 'conception' of feedback. One's conceptions are the beliefs, attitudes and intentions that someone has[4]. So, in this study, conception of feedback refers to the charge nurses' beliefs, attitudes and intentions towards feedback. These feedback conceptions could influence their feedback practises towards their nursing staffs while they are on duty as [1] stated that one's conceptions contribute a lot to one's behaviour. In general, the aim of feedback is to improve achievement. Feedback is also conducted to develop confidence of learners to do peer-assessment or self-assessment, to ensure that learners are actively engaged in their own learning and to promote learning[6]. It should not be something personal or confidential but it has to based on real evidence. To gain this, a feedback has to be constructive. [2]has listed few characteristics of a constructive feedback which are the goal and standard

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of the feedback has to be clear, exact and not vague, the information given to learners must be in a descriptive form. Next, a good feedback must be action-oriented and also solution-oriented. In addition, it has to be strictly confidential as to maintain trust between the assessor and the one being assessed. The least effective way is to give grade to the staff under them[21]. By giving only grades, the students are not able to determine what they are supposed to do to improve towards their goals. The best ways to give feedback is to provide an information on the correct answers plus some explanation and specific activities for improvement.

Problem Statement: Every day, charge nurses will face various kinds of challenges when dealing with staff nurses such as specific assignments requested by staff nurses or the challenges in increasing staff satisfaction[17]. And, one of the five main principles listed by The American Nurses Association is to assess staff skills. When assessing staff skills, not only the clinical skills that the charge nurses have to consider, but it is more than that. The whole scope of practices have to be considered such as the staff nurses characteristics, competencies, years of experience, culture and emotional intelligence and so on. When assessing, feedback will come into play as feedback could serve as a medium to enhance thinking skills[8] of staff nurses. An effective feedback might give opportunities for staff nurses to change their skills which they have previously misinterpreted or to change their motivational beliefs and self esteem[23].In addition, interviews have been conducted with few of charge nurses in public hospitals and they agree that they do not really understand the concept of feedback elements like peer and self-feedback, timeliness of feedback and things that they are supposed to focus at when giving feedback to staffs. Lack of understanding in feedback conceptions might be the reason why they are sometimes confused when it comes to assessing their staffs formatively. Hence, the researchers decided to gain data using this exclusive set of questionnaire from New Zealand researchers which has been tested in few countries[5]. Since this instrument was to be used in the Malaysian health care context, this instrument has to go under pilot study to check for validity and reliability of the instrument as only valid and reliable instrument can be used for real study.

Method

This study is using a quantitative approach which involves 163 charge nurses randomly selected from three states. The instrument used is 'Teacher Conceptions of Feedback (TCoF) inventory adapted from[9]. It consists of 9 constructs altogether with 37 items. They are Conception-Irrelevance (Students Ignore) – 4 items, Conception-Improvement (Student Use) – 4 items, Conception-Accountability (Expected) – 3 items, Conception-Encouragement + Self Type (Praise) – 6 items, Task Type– 3 items, Process Type– 4 items, Self-Regulation Type– 5 items, Peer & Self Assessment– 3 items and Timeliness– 5 items). An example of item from the second construct is 'Staff uses feedback given to improve his/her work', item from the fourth construct is 'Peers are the best source in giving feedback'. The scales were measured using a 6-point Likert scale ranging from strongly disagree to strongly agree. Using Rasch, the data was analysed to determine the validity and reliability of the TCoF. Initially, the data was not fit at all. When using data from 163 person, the value for raw variance explained by measures is -440.0% and the value for unexplained variance in 1st contrast is 69.4% which does not agree with what suggested by[13]. 58 data were deleted and it left with 105 data only and the data was analysed again. The report of the findings was discussed below.

Findings: The analysis was conducted to test item fit, item polarity, unidimensionality and local independance, items and respondents' reliability and separation index.

Item Fit: The item fit statistics (infit and outfit MNSQ) is the degree of equality between the response pattern and the expected model for each item for all respondents[3]. The misfit item due to the high value of MNSQ or Z-value could affect the unidimensionality of subscales (Linacre, 2007). According to Smith et al. (2006), MNSQ is more stable than Z-std value. According to [14], item with high value of MNSQ is a threat to validity compared to low value of MNSQ. For this study, the accetable range of values for the infit and outfit MNSQ measures are in the range of 0.6 to 1.4[14]. The range for Z-std is -2<Zstd<+2. All items which stay within this range is a productive items. If the items are not within this range, it is suggested to eliminate the items. The Rasch model prepare a fit statistics which could help researchers to come out with important decisions about the data[18]. Table 1 shows most MNSQ infit and outfit values are less than 1.0 which means that there is a lack of variation from the model. All of the items laid between 0.6 to 1.4 except for four items (item A2, A4, E18 and I37). Most items have a good overall

fit and they are retained. Four items are deleted. Looking at the Z-std value, the same thing is concluded. All the four items deleted are not in the range of -2 to +2 so it is better to delete those items.

Table 1. Item measure (INFIT, OUTFIT) MNSQ and Point Measure Correlation

Entry Number	Measure	Standard Error	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PTMEA CORR	Item
1	1.05	.13	1.28	2.1	1.29	2.2	.27	A1
2	1.66	.12	1.82	5.1	1.88	5.1	.09	A2
3	2.53	.17	1.37	2.2	1.34	2.1	-.08	A3
4	2.18	.17	1.77	4.2	1.70	3.6	-.03	A4
18	-0.04	.13	1.66	3.6	1.58	3.7	.41	E18
35	1.35	.13	1.40	3.4	1.40	3.5	.31	I35
37	0.16	.13	1.88	5.2	1.88	5.7	.29	I37

Item Polarity: Item polarity is an indicator showing that the items moving in one direction as intended by constructed constructs. Point Measure Correlation (PMC) is a statistical item showing the correlation results between one points and scores for all candidates. Item polarity analysis using PMC is an early detection method for construct validity. The positive value shows that the item is in the same direction with the construct. However, if the value is negative, it shows that something has to be done by the researcher as it indicates that the item or the respondent contradict with the variables[12]. However, the acceptable value is 0.2 or more. In this study, the PMC value of all items are more than 0.2 except for the three items which are item A2 (PMC=0.09) A3 (PMC=-0.08) and item A4(PMC=-0.03). All the three items are deleted. So, most items have a good discrimination value.

Unidimensionality and Local Independence: This two measures are important as they are interconnected with each other[10]. Unidimensionality refers to a condition where items are measuring in one dimension[21]. Furthermore, unidimensionality and local independence allow us to detect whether an item is showing a different dimension or not, the item is understood or not and whether the response shows the respondents' special skills. Principal Component Analysis is used to detect unidimensionality and local independence. A good unidimensionality is when the raw variance explained by measures is more than 40% [2] or more than 60% [16]. The unexplained variance in the 1st contrast must be less than 15% [2] or less than 5% [16]. [2] states that for raw variance explained by measures, values higher than 40% is a strong dimension, higher than 30% is a moderately strong dimension and if it is more than 20%, it is a moderate dimension. The raw variance explained by measures show a value of 52.0% (higher than 40.0%) and the unexplained variance in 1st contrast is 5.2% (less than 15%) (Table 2). So, it is clear that items are not confusing with a strong dimension measures. When unidimensionality assmptions are fullfilled, then the local independence caharacteristics would be fulfilled automatically[16].

Table 2. Standard residual variance (in Eigenvalue units)

	Empirical			Modeled
Total raw variance in observations	70.6	100.0%		100.0%
Raw variance explained by measures	32.1	52.0%		51.4%
Raw variance explained by persons	6.1	10.3%		10.0%
Raw variance explained by items	26.0	36.8%		36.7%
Raw unexplained variance (total)	38.0	52.0%	100.0%	52.2%
Unexplained variance in 1st contrast	3.5	5.2%	11.1%	
Unexplained variance in 2nd contrast	3.2	5.2%	9.4%	

Reliability and Separation: Reliability of an instrument is precision. Item reliability indicates whether items are interacting well with one another showing the same attibutes[21]. On the other hand, person reliability shows reproducibility as expected if the samples are measuring the same construct in a set of items[22]. This is the same as the Cronbach Alpha value. Next is the item and person separation index. Item separation index shows the separation of item difficulty level whereas person separation index shows the separation or the difference of individual following different capability. For both measures, as long as it is more than 2.0, the measures are good. The summary of statistics of person and item are shown in Table 3. For summary of 37 measured item, item reliability is 0.87. For summary of 102 measured person, person reliability is 0.81. This shows that the reliability values are high and acceptable[15]. [14]also stresses that for an instrument to be reliable, the reliability value has to be more than 0.80. Furthermore, it shows that person factor is stable and consistent when measured. The instrument separation should at least be more than 1.0 and a value less than that shows that there might be an overlapping items or less person variability in the trait. In this study, item separation index was 7.29 which indicated the existance of 7 to 8 item strata while person separation index was 2.81 which indicated the existance of 3 people strata. However, as stated by[13], for both measures, as long as it is more than 2.0, then the measures are good.

Table 3. Summary of person and item measure

Summary of Person Measurement					
		INFIT		OUTFIT	
	Measurement	MSQ	ZSTD	MSQ	ZSTD
Mean	0.33	1.00	-0.1	1.00	-0.1
SD	0.67	0.37	1.9	0.39	1.2
Separation	2.81				
Person Reliability	0.81				
Summary of Item Measurement					
Mean	0.00	0.99	-0.2	1.00	-0.1
SD	1.05	0.36	2.5	0.29	2.7
Separation	7.29				
Item Reliability	0.87				

Discussion and Conclusion

This study aims to validate an instrument in assessing feedback conceptions amongst charge nurses in public hospitals in Malaysia using Rasch Model. The findings suggested that most items fit the model as their MNSQ values are between 0.6 to 1.4 except for four items, items A2, A4, E18 and I37 which have MNSQ infit and outfit more than 1.5. Three items do not agree with the item polarity accepted range. Two items show a negative value and the other one item has a value of less than 0.2. So, all the three items are deleted. Unidimensionality is not really an issue as it shows a good unidimensionality when the raw variance explained by measures is 52.0% which is more than 40.0%. This indicates that all the nine constructs are quite different from one another. This instrument with 37 items which represents 9 constructs shows good and acceptable indices of item and person reliability. This shows that items are consistent. After going through data analysis, finally five items were deleted. The overall item quality was good. The instrument is capable in assessing charge nurses' conceptions of feedback in the Malaysian health care system context. However, a more detailed analysis is needed, if possible. Maybe an Item Response Theory could be used for further investigation. In conclusion, for any instrument to be used in real study, it has to go through pilot testing to check for its validity and reliability. The development of this instrument in a different context cannot be assumed that it could fit with any other samples.

Conflict of Interest: Nil

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Factors Associated with Hypertension among Adults in West Java, Indonesia

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Abstract

Background: Hypertension is influenced by various factors including genetic, environmental and lifestyle factors.

Objectives: We aimed to identify factors associated with hypertension among adults in West Java, Indonesia.

Material and Method: The study design was a cross-sectional approach using secondary data from the 'Cohort Study of Non-Communicable Diseases (NCD)' conducted in Kebon Kalapa Village, Bogor City, Indonesia in 2017. This descriptive study used a structured questionnaire to collect primary data distributed to respondents after obtaining their consent. Nutritional status and blood pressure data were collected from participants. A 24-h dietary recall was conducted to collect nutrient intake data. Data were analysed using IBM SPSS software version 24.0.

Results: The prevalence of hypertension in this study was 34.2% and 23.9% of respondents were hypertensive. Bivariate analysis revealed that age 45–59 years, female gender, history of hypertension, overweight, and obesity were associated with hypertension status (P values = 0.0005, respectively, and odds ratios = 2.59, 2.37, 40.06, 7.60 and 10.04, respectively).

Conclusions: Factors associated with hypertension among adults in West Java, Indonesia included older age, female gender, history of hypertension, and nutritional status.

Keywords: *Hypertension, factors, adults, cross-sectional.*

Introduction

Hypertension is a disorder of blood pressure (BP) regulation due to increased cardiac output or total peripheral vascular resistance.[1] Late diagnosis of hypertension can lead to various other diseases, such as heart disease, stroke and kidney failure.[2]

The prevalence of hypertension in Indonesia based on the Indonesian Basic Health Research 2018 was 34.1%. Based on these data, among the 34.1% of people who experienced hypertension, only 1 in 4 were diagnosed and only 54.4% took regular medication for hypertension.[3]

Many studies have identified the main risk factors for developing hypertension to be male gender,[4-5] older age,[4,6,7] overweight,[4,8,6] obesity,[4,8,6,9] retirement, smoking habit,[4,10] illiteracy,[4,10,7] upper socioeconomic status, alcohol consumption, marriage,[4,5] smoking habit,[4,9] lack of physical activity,[9] and diabetes.[7,9]

The major risk factors for hypertension and the extent of their contribution remain unclear. Overcoming hypertension is challenging, given the high prevalence and lack of awareness of its long-term clinical impact. Furthermore, hypertension increases the risk of future health impact if it is not detected and treated early.

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Studies have shown that targeting factors associated with hypertension is one of the best preventives that can be considered when determining intervention strategies for hypertension. Therefore, the present study aimed to identify factors associated with hypertension among adults in West Java, Indonesia.

Materials and Method

The study design was a cross-sectional approach using secondary data from the 'Cohort Study of Non-Communicable Diseases (NCD)' conducted in Kebon Kalapa Village, Bogor City in 2017. The population included permanent residents aged 25–59 years which was registered in the cohort study 2017. The study sample was selected by total sampling, and included individuals with and without hypertension.

There were 1186 initial respondents in total. We excluded respondents with heart disease, stroke and pregnant (n = 118), age ≥ 60 years (n = 49), users of hormonal contraception (pills, injections, implants) (n = 132) and outliers based on nutrient intake (n = 160). A final total of 727 respondents were included in the study.

The dependent variable was hypertension status. The independent variables were age, gender, smoking habits, family history of stroke, physical activity, history of hypertension, medication compliance, nutritional status, and nutrient intake.

Systolic and diastolic blood pressure (SBP and DBP) were measured using a digital tensimeter. Hypertension status was determined based on an average SBP ≥ 140 mmHg and/or DBP ≥ 90 mmHg[11] and/or taking anti-hypertensive drugs.[12]Body height was measured using a height measuring device with 0.1-cm accuracy, while body weight was measured using a digital weighing device with an accuracy of 0.1 kg. Nutritional status was categorised based on body mass index (BMI) as follows: underweight (<18.4 kg/m^2), normal (18.5–25.0 kg/m^2), overweight (25.1–27.0 kg/m^2) and obese (≥27 kg/m^2).[13]

Characteristics of study participants were collected using a questionnaire developed specifically for NCD cohort studies. Age was divided into two groups: 25–44 and 45–59 years.

Food consumption data was collecting using 24-h dietary recall. Nutrient intake was calculated based on the Indonesian recommended dietary allowance in the normal population, while intake in the hypertensive population was calculated based on the Dietary Approaches to Stop Hypertension (DASH) recommendations.[14]Nutrient intake was grouped as low (<90%), moderate (90%–119%) and excessive (≥120%).

Data were analysed using IBM SPSS software version 24.0 including univariate and bivariate analysis. Bivariate analysis was used to determine the relationship between each independent variable and dependent variable using the chi-square and Fisher exact test. Risk was calculated using odds ratios (ORs). A simple logistic regression test was used to calculate *P*-value and OR for independent variables with more than two categories.

Results

The average age, SBP, and DBP in the hypertensive group was higher than that in the normal population. Fat and sodium intake was higher in the normal population compared with that of the hypertensive group. The distribution of numerical variables of the participants is presented in Table 1.

Table 1. Distribution of numerical variables of study participants.

Variable	Normal Population		Hypertensive Population		Total	
	N	Mean ± SD (min–max)	N	Mean ± SD (min–max)	N	Mean ± SD (min–max)
Age (Years)	553	45.97 ± 7.83 (30–59)	174	50.82 ± 6.30 (31–59)	727	47.13 ± 7.77 (30–59)
SBP (mmHg)	459	120.77 ± 13.89 (87.50–167.00)	150	148.11 ± 19.75 (103.50–207.00)	609	127.50 ± 19.49 (87.50–207.00)
DBP (mmHg)	459	79.15 ± 9.48 (55.50–109.50)	150	94.77 ± 11.94 (69.70–141.30)	609	82.99 ± 12.17 (55.50–141.30)
Weight (kg)	459	59.76 ± 11.61 (32.80–100.30)	150	64.59 ± 12.83 (36.50–97.20)	609	60.95 ± 12.09 (32.80–100.30)

Variable	Normal Population		Hypertensive Population		Total	
	N	Mean ± SD (min–max)	N	Mean ± SD (min–max)	N	Mean ± SD (min–max)
Height (m)	459	1.56 ± 0.08 (1.33–1.81)	150	1.52 ± 0.06 (1.38–1.69)	609	1.55 ± 0.08 (1.33–1.81)
BMI	459	24.76 ± 4.74 (14.51–39.54)	150	27.94 ± 5.15 (17.03–42.33)	609	25.54 ± 5.03 (14.51–42.33)
Nutrient intake:						
Energy (kcal/day)	458	2034.85 ± 619.26 (719.88–3571.42)	150	1652.42 ± 478.89 (748.29–2729.62)	608	1940.50 ± 610.12 (719.88–3571.42)
Protein (g/day)	458	63.22 ± 21.16 (16.25–119.14)	150	52.95 ± 16.84 (16.18–101.33)	608	60.69 ± 20.65 (16.18–119.14)
Carbohydrate (g/day)	458	274.66 ± 91.71 (87.83–508.33)	150	228.68 ± 73.35 (75.54–429.34)	608	263.32 ± 89.70 (75.54–508.33)
Fat (g/day)	458	77.55 ± 31.81 (8.14–161.34)	150	58.77 ± 21.82 (16.78–107.41)	608	72.91 ± 30.73 (8.14–161.34)
Sodium (mg/day)	458	2374.47 ± 1195.38 (221.98–5495.63)	150	1839.63 ± 839.56 (205.57–4092.47)	608	2242.52 ± 1151.11 (205.57–5495.63)

The prevalence of hypertension in the present study was 34.2%, and 23.9% of respondents were hypertensive. Excessive fat and sodium intake was observed in 247 (40.6%) and 371 (60.1%) participants, respectively. Bivariate analysis revealed that age 45–59 years, female gender, history of hypertension and nutritional status were found to be associated with hypertension status.

Respondents aged 45–59 years showed a 2.59-fold higher risk of hypertension compared with those aged 25–44 years. Females showed a 2.37-fold higher risk than males, and respondents with a history of hypertension showed a 40.06-fold higher risk. Nutritional status was a risk factor for developing hypertension, and was 7.60-fold higher for overweight and 10.04-fold higher for obese individuals compared with those with normal nutritional status.

While excessive fat and sodium intake showed a 0.46 and 0.53-fold lower risk, respectively, compared with low fat and sodium intake.

The results of the bivariate analysis between characteristics of participants with and without hypertension status are presented in Table 2.

Table 2. Relationship between the characteristics of study participants according to hypertension status.

Variables	Hypertension Status				Total		OR	P-value
	No		Yes					
	N	%	N	%	N	%		
Age (Years)								
25–44	167	78.8	45	21.2	212	100.0	1	Ref
45–59	234	58.9	163	41.1	397	100.0	2.59	0.0005*
Gender								
Male	182	77.1	54	22.9	236	100.0	1	Ref
Female	219	58.7	154	41.3	373	100.0	2.37	0.0005*
Smoking Habit								
No	21	24.4	65	75.6	86	100.0	1	Ref
Yes	188	66.9	93	33.1	281	100.0	0.16	0.0005*

Variables	Hypertension Status				Total		OR	P-value
	No		Yes					
	N	%	N	%	N	%		
Family History of Stroke								
No	363	66.4	184	33.6	547	100.0	1	Ref
Yes	38	61.3	24	38.7	62	100.0	1.25	0.511
Physical Activity:								
High								
Yes	32	76.2	10	23.8	42	100.0	1	Ref
No	366	64.9	198	35.1	564	100.0	1.73	0.187
Moderate								
Yes	381	64.9	206	35.1	587	100.0	1	Ref
No	17	89.5	2	10.5	19	100.0	0.25	0.048*
Low								
Yes	214	64.5	118	35.5	332	100.0	1	Ref
No	184	67.2	90	32.8	274	100.0	0.89	0.542
History of Hypertension								
No	384	83.7	75	16.3	459	100.0	1	Ref
Yes	17	11.3	133	88.7	150	100.0	40.06	0.0005*
Medication Compliance								
Yes	0	0.0	77	100.0	77	100.0	1	Ref
No	2	13.3	13	86.7	15	100.0	0.000	0.997
Nutritional Status								
Underweight	39	45.3	47	54.7	86	100.0	12.69	0.0005*
Normal	200	91.3	19	8.7	219	100.0	1	Ref
Overweight	54	58.1	39	41.9	93	100.0	7.60	0.0005*
Obese	108	51.2	103	48.8	211	100.0	10.04	0.0005*
Nutrient Intake:								
Energy								
Low	204	59.8	137	40.2	341	100.0	1	Ref
Moderate	133	72.3	51	27.7	184	100.0	0.57	0.005*
Excessive	63	75.9	20	24.1	83	100.0	0.47	0.007*
Protein								
Low	150	49.2	155	50.8	305	100.0	1	Ref
Moderate	126	80.3	31	19.7	157	100.0	0.24	0.0005*
Excessive	124	84.9	22	15.1	146	100.0	0.17	0.0005*
Carbohydrate								
Low	259	64.3	144	35.7	403	100.0	1	Ref
Moderate	103	66.9	51	33.1	154	100.0	0.89	0.563
Excessive	38	74.5	13	25.5	51	100.0	0.62	0.150
Fat								
Low	116	56.9	88	43.1	204	100.0	1	Ref
Moderate	101	64.3	56	35.7	157	100.0	0.73	0.151
Excessive	183	74.1	64	25.9	247	100.0	0.46	0.0005*
Sodium								
Low	82	56.6	63	43.4	145	100.0	1	Ref
Moderate	55	59.8	37	40.2	92	100.0	0.88	0.624
Excessive	263	70.9	108	29.1	371	100.0	0.53	0.002*

*P< 0.05

Discussion

The results of the present study revealed that hypertension was influenced by age. High incidence of hypertension was associated with increasing age, caused by changes in the structure of large blood vessel, such as narrowing of the lumen and stiffening of blood vessel walls, as a result of increased SBP.[15] Another factor related to hypertension was female gender. This finding is consistent with the findings of some studies.[16,17] In this study, most respondents in the age 45–59 years and hypertensive groups were females. In women, incidence of hypertension increases after menopause. Before age 50, women show a lower prevalence of hypertension compared with men, but after age 55, women show a greater age-related increase in proximal aortic stiffness, leading to a higher incidence of systolic hypertension. Women have two other features that tend to reduce DBP and widen pulse pressure. First, short stature causes a faster return of pulse waves to increase peak systolic pressure, and second, a faster heartbeat produces a shorter diastolic period.[15] However, other studies found that hypertension is more common in men.[4-10]

Hypertensive respondents tend to experience high BP more frequently due to inelastic blood vessels. Other factors may also play a role, such as lifestyle, medication compliance and nutritional status. Although medication adherence helps to control BP, this still requires a healthy lifestyle.[18] In the present study, medication compliance data was not sufficient to explain this finding.

Overweight and obese respondents had a higher risk of hypertension than those with normal nutritional status. An association between excessive activation of the sympathetic nervous system and the renin–angiotensin–aldosterone system (RAAS) was shown in obese people, increasing the risk of high BP.[19]High RAAS has been shown to increase sodium reabsorption which carries water so that the body tends to be hypervolemic, which ultimately increases cardiac output and BP.[20]

In the present study, excessive fat and sodium intake showed less risk compared with low fat and sodium intake. This could be due to hypertension being affected by many risk factors. Alternatively, respondents with low fat and sodium intake may have had a history of hypertension. People with hypertension tend to decrease their sodium and fat intake to prevent disease complications. This diet pattern would affect the outcome of the relationship between fat and sodium intake with hypertension status. This relationship may be affected by weight status or presence of metabolic disorder.[21]In the present study, most respondents with low fat and sodium intake were overweight and obese.

There is conflicting evidence about the effect of dietary fat intake on BP. Some studies have shown a positive correlation between dietary cholesterol intake and BP, while others found no significant correlation.[21] In another study, the relationship between dietary cholesterol and SBP was slightly stronger in the non-hypertensive group. Possible mechanisms include dietary cholesterol related to endothelial dysfunction and reduced nitric oxide bioavailability, which may lead to functional arterial stiffening leading to high BP.[22]

Conclusion

In the present study, the prevalence of hypertension was 34.2%, and 23.9% of respondents were hypertensive. Older age, female, history of hypertension and nutritional status were associated with hypertension status.

Our findings may help to determine suitable interventions to overcome and prevent the incidence of hypertension and also to find further strategies to prevent uncontrolled hypertension complications. Further studies are required to alleviate hypertension from year to year based on factors that influence the incidence of hypertension.

Conflict of Interest Statement: There are no conflicts of interest.

Ethical Clearance: This research had received ethical approval from The Research and Community Engagement Ethical Committee Faculty of Public Health Universitas Indonesia Ket-550//UN2.F10/ PPM.00.02/2019.

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Correlation of Interleukin-6 with Serum Estradiol Mean Levels in Menopause Women at Rsup H Adam Malik Medan

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Abstract

Aim: To determine the correlation of Interleukin-6 (IL-6) with serum estradiol levels in menopausal women.

Method: This research is a case series research in postmenopausal women to assess the correlation between Interleukin-6 (IL-6) and serum estradiol levels that performed at H Adam Malik General Hospital Medan, starting in August 2017 until 38 samples which met the inclusion and exclusion criteria were fulfill,using non probability sampling technique with consecutive sampling. Serum estradiol and IL-6 levels was examined, then sent to the clinical laboratory. Data tabulated to be analyzed statistically.

Results: The mean serum estradiol level in menopausal women is 29.74 ± 18.69. The mean IL-6 level was 85.03 ± 33.66, in this research showed that in menopausal women there was an increase in IL-6 levels. By using the Spearman Test, the results showed that there was a significant correlation between estradiol and IL-6 with p value <0.004.

Conclusion: There is a significant negative correlation between serum estradiol and IL-6 levels, which means that there is an inverse relationship between serum estradiol and IL-6 levels with weak negative strength, where decreasing estradiol does not always increase IL-6 levels.

Keyword: *Estradiol, Interleukin-6, IL-6, Menopause, Inflammation.*

Introduction

In women with normal menstrual cycles, estradiol is the most estrogen produced by the ovary. Estradiol levels range from 40-80 pg/mL during the reproductive cycle.[1,2] 17ß-estradiol is primary estrogen originating from the ovary. Estradiol (E2 or 17β-estradiol) is a steroid hormone derived from cholesterol metabolism targeting various tissues in the female reproductive organs.The circulating estradiol level after menopause is around 10-20 pg/mL which mostly comes from peripheral conversion of estrone derived from peripheral conversion of androstenedione. The average rate of postmenopausal estrogen production is around 45µg/24 hours. [3-6]

IL-6 levels are increased in postmenopausal women compared to premenopausal women. The decrease in estrogen, especially estradiol, plays a role in increasing IL-6 during menopause. Estradiol plays a role in inhibiting proinflammatory cytokine gene expression,

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NF-κB binding, and the production of proinflammatory cytokines including IL-6.There is also a positive correlation between IL-6 and expression of estrogen (ERα) receptors. [9-12] Interleukin-6 (IL-6) is a cytokine that not only plays a role in the inflammatory process and response to infection but also plays a role in metabolic, regenerative, homeostasis bone, reproduction, and neural processes. IL-6 is a unique cytokine, because besides its activity as a proinflammatory cytokine, IL-6 also plays a role in the anti-inflammatory and regeneration process.[7-8]

There is a hypothesis that estrogen can cause a decrease in serum IL-6 levels because estrogen inhibits osteoblasts as producers of IL-6 and estrogen works as an IL-6 receptor antagonist so that IL-6 work can be inhibited.[13]In the Nasution research which showed that IL-6 production showed a correlation positive with the occurrence of bone resorption in postmenopausal women through the RANKL-independent mechanism.[14] Research conducted by Kim, et al. found that attractively circulating IL-6 is influenced by age and menopause and changes in estrogen after menopause will increase the production of peripheral mononuclear cell cytokines in postmenopausal women which cause an increase in IL-6 which correlates with the occurrence of oxidative stress.[15] Research conducted by Yang, et al, Novella, et al., Rahnama, et al., and Engelmann et al., also showed similar results about the relationship between estrogen levels and IL-6.[16-19]

Material and Method

This research is a case series research to assess the correlation between Interleukin-6 (IL-6) and serum estradiol levels in menopausal women. This research was conducted at H Adam Malik General Hospital Medan and began in August 2017 until the sample size was fulfilled. The research population was female paramedics who had not experienced menstruation during the last 12 months then subjects were determined by using nonprobability sampling technique with consecutive sampling where samples that met the inclusion criteria which is willing to take part in the research, sign informed consent and female paramedics who hadn't menstruation for the past 12 months, and exclusion criteria namely hormone replacement therapy, alcohol consumption, smoking, suffering from diabetes mellitus, having a history of treatment of organic mental disorders, suffering from malignancy. The number of samples obtained is 38 samples.

Serum estradiol & 1L-6 examination: For estradiol, using the reagent "Vidas Estradiol II". Use one strip "E2II" and one SPR "E2II" for each sample, control or calibrator to be tested. Perform the test as directed at User's Manual. All testing steps are carried out automatically by the instrument. Repeat each vial and return it to a temperature of 2-8° C after pipetting. The test will be completed in about 60 minutes. After the test is complete, remove the SPR and strip from the instrument. For IL-6, Reagent "*Human IL-6 (Interleukin-6) ELISA Kit Elabscience*" is used. And add 100 µL of *Biotinylated Detection Ab working* solution to each tube. Add 100 µL*HRP Conjugated Working Solution* in each tube. Add 90 µL of reagent substrate to each tube. Cover with a new cover. Incubate for 15 minutes at 37° C. Protect the plate from exposure to light. Add 50 Ml*stop solution* to each tube.

Findings: Mean Levels of Estradiol and IL-6 in Menopausal Women for Characteristics of Age, Parity, Body Mass Index (BMI), and Duration of Menopause

Table 1. Mean Levels of Estradiol in Menopausal Women for Characteristics of Age, Parity, BMI, and Duration of Menopause

Characteristics	Total (n)	Mean±SD
Age		
• 40-49 y.o.	17	48.1±23.9
• 50-59 y.o.	21	37.5±21.3
• > 60 y.o.	0	0
Parity		
• Nullipara	0	0
• Primipara	0	0
• Multipara	38	42.4±3.71
• Grandemultipara	0	0
BMI		
• Normoweight	4	44.7±13.9
• Overweight	9	47.9±28
• Obesitas	25	39.8±22.1
Menopause Duration		
• ≤ 2 y.o.	20	53.3±23.5
• 3 y.o.	6	40.6±18.3
• ≥ 4 y.o.	12	24.5±9.2

Table 2. Mean Levels of IL-6 in Menopausal Women for Characteristics of Age, Parity, BMI, and Duration of Menopause

Characteristics	Total (n)	Mean±SD
Age		
• 40-49 y.o.	17	30.3±16.8
• 50-59 y.o.	21	55.5±51.9
• > 60 y.o.	0	0
Parity		
• Nullipara	0	0
• Primipara	0	0
• Multipara	38	44.2±41.7
• Grandemultipara	0	0
BMI		
• Normoweight	4	25.4±16.8
• Overweight	9	19.3±3.9
• Obesitas	25	56.2±46.9
Menopause Duration		
• ≤ 2 y.o.	20	29.7±18.1
• 3 y.o.	6	28.2±10.8
• ≥ 4 y.o.	12	76.6±59.7

Table 1. From the table, it can be seen in the group of 40-49 years having a mean level of estradiol of 48.1 pg/mL, whereas in the age group 50-59 years it has a mean level of estradiol of 37.5 pg/mL, so this indicates that the more increasement of age diminished exposure to estrogen.

Table 2. The table presents data that the longer the duration of menopause, the higher the level of IL-6 that can be seen from IL-6 levels in the group with menopause <2 years, the mean IL-6 level is 29.7 pg/mL, whereas in the age group of menopause> 4 years it was seen that mean IL-6 levels is 76.6 pg/mL.

Means Levels of Estradiol in Menopausal Woman

Table 3. Means Levels of Estradiol in Menopausal Woman

	Mean ± SD
Estradiol (pg/mL)	29.74± 18.69

According to table 3.it is known that the mean estradiol level in menopausal women is 29.74 ± 18.69.

Means Levels of Interleukin-6 (IL-6) in Menopausal Woman

Table 4. Means Levels of IL-6 in Menopausal Woman

	Mean ± SD
IL-6 serum (pg/ml)	85.03 ± 33.66

Based on table 4., it is known that the mean IL-6 level is 85.03 ± 33.66, in this research showed that in menopausal women there was an increase in IL-6 levels.

Correlation between Estradiol and IL-6 levels in menopausal woman

Table 5. Correlation between Estradiol and IL-6 levels in menopausal woman

Correlation	r value	p-value
Estradiol and IL-6	-0.458	0.004

Using the spearman test showed a significant correlation between estradiol and IL-6 levels with p value <0.004. The correlation coefficient is -0.458, which means that there is an inverse relationship between estradiol and IL-6 levels with weak negative forces, where decreasing estradiol does not always increase IL-6 levels.

Estradiol Mean Levels in menopausal woman for Characteristics of Age, Parity, Body Mass Index, and Duration of Menopause: The research conducted by Puspita, E.M in 2017 concluded that the aromatic aromatization process was related to women's body weight.[21] In line with research conducted by Mafucci and Gore in Morisson in 2006, which concluded that almost all mammals and vertebrates have decreased reproductive capacity during the aging process. However, menopause is unique to species with a woman's menstrual cycle. In the end, the limited collection of female ovarian follicles causes a decrease in the circulation rate of steroid hormone estradiol.[23,24]

IL-6 Mean Levels in menopausal woman for Characteristics of Age, Parity, Body Mass Index, and Duration of Menopause: The research conducted by Kim, OY obtained the results that the more age increases the higher the level of IL-6 and in this research concluded that this data is related to advanced age phenomena together with menopause, age-related increase in IL-6 in circulation in line with the findings of previous researches.[25]Many studies have also reported an increase in proinflammatory serum markers, especially IL-6

after menopause, indicating that in addition to age, in postmenopausal women, changes in the immune system have been associated with estrogen deficiency.[20]

Means Levels of Estradiol in Menopausal Woman: According to the 2012 Stanzyckresearch, it was found that estrogen levels were at a low concentration (<30 pg/mL) in prepubertal and postmenopausal women, [26] From Kaur's research in 2017, the mean estradiol value was 27.41 ± 5.05 pg/mL.[27]While the Mawiresearch in 2010 found that the mean serum estradiol was 7.54 ± 4.65 pg/mL in postmenopausal women.[28] Research Lkhagvasuren et al. the mean estradiol was 18.3 ± 13.1 pg/mL.[29]

Consistent with the theory, estradiol levels in postmenopausal women are lower than women of reproductive age in each phase of the menstrual cycle.[30]In menopausal women there is a decrease in ovarian follicular activity, the follicles will experience atresia until there are no more follicles to produce estrogen hormones.

Means Levels of Interleukin-6 (IL-6) in Menopausal Woman: The same result is seen in Jabber et al .'s 2015 research of obtaining data on mean IL-6 values in postmenopausal women of 23.9 ± 5.52.[30] In Rachon'sresearch, et al., the mean serum estradiol was 4.44 ± 2.10 pg/mL.[32] Aging theory is associated with a slight and chronic increase in several serum inflammatory mediators such as TNF-α, IL-6, and IL-1ß. TNF-α and IL-1ß with IL-6 can stimulate their production with each other.[25,33-41]According to Kim's research, 2012, it was found that there was an increase in IL-6 in postmenopausal women, a decrease in the immune system associated with a decrease in estrogen.[25]

Correlation between Estradiol and IL-6 levels in menopausal woman: The decline in estrogen, especially estradiol plays a role in increasing IL-6 during menopause. Estradiol plays a role in inhibiting proinflammatory cytokine gene expression, NF-κB binding, and the production of proinflammatory cytokines including IL-6.[18,25,33-35] Estrogen deficiency in postmenopausal women will stimulate bone loss and increase cytokine production such as IL-1, IL-6, and TNF-α.[14]

Conclusion

The results of this research show that there is a significant weak negative correlation between estradiol and IL-6, which means that there is an inverse relationship between Estradiol and IL-6 with weak negative strength, where decreasing estradiol does not always increase IL-6 levels.

Conflict of Interest: The researcher ensures that there is no conflict of interest in this research

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Ethical Clearance: For research permission, research approval was obtained from the research subject and the Ethics Committee of the Faculty of Medicine, University of North Sumatra who would conduct an assessment of the feasibility of the research proposal.

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High Bride Price as Determinant of Marital Stability among Akwa-Ibom People in Surulere Area, Lagos State, Nigeria

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Abstract

Bride price represents a contract between families where material items and money are paid by the groom to the bride's family for the bride for the purpose of marriage. This study investigated High Bride Price as determinant of Marital stability among Married Akwa-Ibom people in Surulere, Lagos State, Nigeria. The purpose of the study was to: (i) assess whether highbride price is a determinant of domestic violence (ii) examinewhether high bride price is a determinant of emotional problem among married Akwa-Ibom people in Surulere, Lagos State.A descriptive research design of survey type was adopted for the study. The population for the study comprised all married Akwa-Ibom people in Surulere, Lagos State.Multi stage sampling technique consisting of purposive, clustered, proportionate and simple random sampling technique was used to sample three hundred and seventy three (373) respondents from two associations in Itire-Ikate Local Council Development Area. Researchers'-designed questionnaire with four point Likert rating scale was used for the study which was validated by experts from the Departments of Health Promotion and Environmental Health Education, Faculty of Education, University of Ilorin, Kwara State. Cronbach alpha statistical tool was used to ascertain the internal consistency of the instrument and a reliability correlation of coefficient, 'r' 0.85 was obtained through split-half method. Data collection was conducted by the researchers and trained research assistants. Inferential statistics of Chi-square (χ^2) was used to analyse the postulated null hypothesesat 0.05 level of significance. The findings of the study showed that marital stability of married Akwa-Ibom people is affected because; i. High bride price is a significant determinant of domestic violence among married Akwa-Ibom people in Surulere because (cal. χ^2value 146.678 is greater than critical x^2 value 21.03) at df 12 at 0.05 level of significance and High bride price is a significant determinant of emotional problems among married Akwa-Ibom people in Surulere because (cal. χ^2 value 143.062 is greater than critical x^2 value 21.03) at df 12 at 0.05 level of significance.The study concluded that high bride price led to domestic violence and emotional problems which determines marital stability among Akwa-Ibom people in Surulere, Lagos State.Therefore, the study recommended that high bride price should be reduced in order to avoid domestic violence which determines marital stability among Akwa-Ibom people and high bride price should be well modified in order to mitigate the occurrences of emotional problems which determine marital stability among Akwa-Ibom people in Surulere Area in Lagos State, Nigeria.

Keywords: *Bride, Price, Determinant, Marital, Stability and People.*

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Introduction

Bride price is a complex system of material remittances in traditional societies which is used to validate customary marriages especially in many African countries. Bride price payment is a form of protection for women within marriages by providing them respect, status and acknowledgement within the

society. However, the payment of bride price ensures women's subordination to husbands, which invariable condoned the abuse of wives[5]. The various elements used as bride price include money, gifts, services or labour, a list of mandatory items (raw food stuffs, clothing, fruits, traditional accessories etc) depending on family type, culture and religion[14].

Marital stability is not only a value term, but also a relative term. It implies firmnessand strength to endure under hard as well as easy circumstances. This element of constancy must not be confused with a static condition[7]. The bride's family gives in to violent behaviours because it can only be committed by husbands willing to abandon their wife if their request is not satisfied. Thus, bride price was found to precipitate violence which has high tendency to affect stability of marriages. This model is such that the husband hurts his wife's well-being in order to extract a payment from his in-laws where he feels the bride price was overpriced[2].

People as social animals who cannot survive alone. From birth to death we are in the company of, and depend upon, significant others for survival. The relationships we partake in, may be life sustaining and nurturing and may promote personal growth and health, or may be abusive, destructive and traumatic[16]. It recorded that research has amply documented that there are short- and long-term mental and physical health benefits when the relationships we partake in throughout life are positive, whereas abusive, restricting and non-nurturing relationships have been found to impair mental and physical health. Sexual, physical or severe emotional abuse (e.g., abandonment, betrayal, malevolent intent, or repeated victimization) often has devastating effects on the recipient[13]. These effects can be long-lasting and broad ranging. Untreated trauma not only has dire effects on the individual (e.g., intense psychological distress, loss of interest among others), but also has broader ranging effect such as social and community disorganization[4].

However, bride price is being misused to abuse girls and women. Men tend to think that after paying the bride price women would become their goods, services and personal property to be owned, mistreated and dumped when they have outlived their purpose and use. The conception produces a negative effect as the relationship between men and is affected[15]. The bride price practice is a leading contributor to the spiralling levels of domestic violence which are witnessed because of the mere perception of the fact that women have been bought and sometimes many of them are forced into marriages. In such marriage, the woman has no sense of worth, respect, pride and accomplishment. This certainly leads to the development of a very negative/low sense of esteem[11]

Domestic violence and poverty are linked to bride price. For instance, a referendum was carried on the need to reform the practice of bride price, which revealed that 60 percent of the respondents insisted that the practice of bride price reduce women and girls to the status of chattel and that their inability to refund the bride price leaves them open to violence and abuse with far reaching social, economic and human rights implications[9].Bride price is a major factor contributing to domestic violence in the relationships, thereby threatening the stability of marriage[10].

High degree of explosive anger among men and women is a reaction pattern that is associated with a range of general factors, including past exposure to traumas related to human rights violations, ongoing deprivations and feelings of injustice. The problem of high bride price is a contributor to poverty, a source of conflict with the spouse and family and a possible cause of their anger[17]. Married couples affected with anxiety often avoid doing things such as going out alone or chatting to people. They usually do so because they assume that they will deal with people badly. For example, they will panic or make a fool of themselves. As an alternative to this, they adopt the avoidance strategy as they think it makes them feel better. They are unaware that the longer they avoid the possible problems, the worse they become. This typical case is so because the avoided actions get more and more associated with anxiety and consequently they find it much harder to face up the problems[5]. There are three basic conditions which elicit anxiety: over-stimulation, cognitive incongruity, and response unavailability. Over-stimulation refers to when married people are flooded with information especially about the wrong knowledge. Cognitive incongruity is when married people have difficulty reconciling with some event. Response unavailability refers to when married people do not know how to handle difficult situations[8].

Statement of the Problems: Marriage is a legal and intimate union between a man and woman which is usually consolidated with a token called bride price as it is the practice in Akwa-Ibom State. When there is marital stability, the strength, balance and level of relationship is

intact. The researcher observed that several factors have generated concern, worries and unrest among married and even intending Akwa-Ibom people as regards the exorbitant items on the list and the financial attachment involved in marrying a woman from that environment.

The researcher has seen reports, witnessed and heard of incidences of physical, sexual and majorly verbal abuse especially among married women, trivial marital conflict between spouses, abandonment of spouse, separation without notice, fear of and hatred for opposite sex, anxiety disorder, depression, chronic stress, high blood pressure, heart disease, psychosomatic disorders amongst others. The researcher observed that married people seemed to have lost identity and their position has been weakened by altered gender relations following ancient tradition which has become an opportunistic means of gathering income, resulting into gender antagonism regarding perceived roles as a result of high bride price paid by men over women. Inthe area of study, the researcher observed that high bride price has affected several marriages, health and wellbeing of the couples negatively. Discussion with married women and men showed that they were experiencing pain, bitterness, lack of affection, attention and support, the accumulation of these negative treatments will in-turn result to the variables discussed in the study.

The researcher witnessed an experience of a close married female relative, who got married to a man that struggled so hard to sort the high bride price because of the love he built for his then intended spouse and did not want to lose her on the ground of bride price. The marriage is three (3) years down the line and whenever they have slight disagreement, the man reminds her of how he went through a lot to pay her bride price in spite of the whole situation surrounding them that period. He taunts her with the bride price everytime and it usually ends with either verbal or physical abuse.

The researcher observed that no study of such has been conducted in the locale of the study, therefore this research seeks to fill this gap of high bride price as determinant of domestic violence, divorce, marital conflict, emotional and psychological problems on marital stability among married Akwa-Ibom people in Surulere, Lagos State.

Research Questions: The following research questions were answered in this study:

1. Will high bride price be a determinant of domestic violence among marriedAkwa-Ibom people in Surulere, Lagos State?
2. Will high bride price be a determinant of emotional problem among married Akwa-Ibompeople **in Surulere, Lagos State?**

Research Hypotheses: The following hypotheses were tested in this study:

1. High bride price will not significantly be a determinant of domestic violence among married Akwa-Ibom people in Surulere, Lagos State.
2. High bride price will not significantly be a determinant of emotional problems among married Akwa-Ibom people in Surulere, Lagos State.

Methodology

Descriptive research design ofsurvey type was adopted for this study. The population of the study comprised all Married Akwa-Ibom People in SurulereArea, Lagos State, Nigeria. A multi-stage sampling technique consisting purposive, cluster, proportionate and simple random sampling techniques was used to select three hundred and seventy three (373) respondents from association meetings at ItireIkate Local Council Development Area, Surulere, Lagos State. Researchers' structured questionnaire of four-point Likert rating scale format with options of Strongly Agree, Agree, Disagree and Strongly Disagree was used for the study. The instrument contained eight (8) items based on two variables namely domestic violence and emotional problem. In order to ascertain the validity of the instrument, three copies of the questionnaire were given to experts in Departments of Health Promotion and Environmental Health Education, Faculty of Education, University of Ilorin. The Split-half method was used to determine the reliability of the instrument using Cronbach Alpha statistical tool to correlate the data and a correlation of coefficient of 0.85 was obtained. Descriptive statistics of frequency and percentage was used to answer the research questions raised for the study while Inferential statistics of Chi-square was used to analyze the stated null hypotheses at 0.05 level of significance, using Statistical Package for Social Science (SPSS) version 20.0 software.

Results/Discussion of Findings

Hypothesis One: stated that the calculated Chi-square (x^2) value is 146.678 and the table (x^2) value is 21.03 with the degree of freedom 12 at 0.05 alpha level.

Since the calculated (x^2) value of 146.678 is greater than the table (x^2) value of 21.03 at 12 degree of freedom. Therefore, the null hypothesis was rejected. This implysthat high bride price is a significant determinant of domestic violence among married Akwa-Ibom people in Surulere, Lagos State, Nigeria. Theresponses of the married people include domestic violence such asphysical, verbal and sexual abuse that could result due to payment of high bride price. This finding is in line with a finding that domestic violence especially against womenis an issue which has and should receive increased attention because of its effect on health and its association with payment of high bride price across various cultures in Nigeria, especially in the south-south region. Married peoplein this area are physically, sexually and verbally disempowered thereby reducing them to commodities. Hence, the result is a battered sense of esteem, emotional imbalance, and it reduces married people to chattels which results to domestic violence[6].

Hypothesis Two: Stated that the calculated Chi-square (x^2) value is 143.062 and the table (x^2) value is 21.03 with the degree of freedom 12 at 0.05 alpha level. Since the calculated (x^2) value of 143.062 is greater than the table (x^2) value of 21.03 at 12 degree of freedom. Therefore, the null hypothesis was rejected. This implys that high bride price is a significant determinant of emotional problem among married Akwa-Ibom people in Surulere, Lagos State, Nigeria. However, the finding is in line with a statement that anxiety as one emotional problem is a major unpleasant emotional state with qualities such as dread, distress and uneasiness[1]. It was mentioned that fear and anger is a observable emotion associated with high bride price that exist among Akwa-Ibom people at the point of payment of bride price[9].

Recommendations: Based on the conclusion of the study, the researcher made the following recommendations:

i. High bride price should be reduced in order to avoid domestic violence which determines marital stability among married Akwa-Ibom people.

ii. High bride price should be well modified in order to mitigate the occurences of emotional problems which determines marital stability among married Akwa-Ibom people.

General recommendations:

iii. The government should structure a strong and reliable team to enlighten single and married on domestic violence by inviting key speakers from related agencies such as National Domestic Violence Outreach Organization, National Center for Victims of Crime, National Coalition against Domestic Violence to present at religious or professional organization, civic or volunteer group, workplace, or school from time to time.

iv. Married Akwa-Ibom people in Surulere should be sensitized and educated by Family life and Reproductive health educators on the topic of the domestic violence and the provision of needful tools in tackling all forms of abused in marriage.

v. Married Akwa-Ibom people should seek continuous counsel on the subject of personality different and emotional needs of men and women.

Ethical Clearance: Taken from Faculty of Education Ethical Review Committee, University of Ilorin. Ilorin, Kwara State, Nigeria.

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Psychosomatic Impact of Social Networking Sites on Society and its Subtle But Real Consequences

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Abstract

The paper intends to focus on the issues of psychological and emotional impact of individuals due to excessive use of Social Networking Sites and intends to dwell into these concepts to highlight that excessive use of such sites have a substantial impact on the well-being of an individual emotionally and physically and while Social media has become immensely popular so has the mental disorderliness among young adults. The paper also brings in light the concept of 'Facebook/Insta Depression' as a concept and the rise of the this depression in young adults and some suggestions as to how avoid/deal with it.

Keywords: *Psychological, Social Networking, Social Networking Sites.*

Introduction

It's good to be happy and tell us how cool your life is and how awesome you are on social media. That's great because it inspires other people to be happy, too. But a lot of times, people are trying to be happy in the wrong ways-with money or with different things that are not true happiness. *–Jaden Smith*

Social Networking Sites (SNSs) such as Orkut, Facebook, Twitter and Instagram have attracted millions of users, many of whom have integrated these sites in their daily life and practices. There exists hundreds of Social Networking Sites with various technological affordances and supporting a wide range of interests and practices. While there key technological features are fairly consistent. The cultures that emerge around Social Networking Sites are varied and are different from site to site. Most sites support the maintenance of pre-existing social networks, but others help strangers connect based on shared interests, political views, or activities. Some sites cater to diverse audiences, while others attract people based on common language or shared racial, sexual, religious, or nationality-based identities. Sites also vary in the extent to which they incorporate new information and communication tools, such as mobile connectivity, blogging, and photo/video-sharing. Scholars from diverse fields have examined Social Networking Sites in order to understand the practices, implications, culture, and meaning of the sites, as well as the users' engaged with them.

They are increasingly attracting the attention of academic and industry researchers intrigued by their affordances and reach. Due to the internet, the term society is not dependent upon a region as the dynamics of the internet has connected the planet as a whole and the cultures that emerge around SNSs are varied and diversified.

Social Network Sites: A Definition: The definition of a Social Networking Sites is that, "Social Networking Sites are web-based services that allow individuals to

- Create a public or semi-public profile within a bounded system.
- Articulate a list of other users with whom they share a connection; and
- View and traverse their list of connections and those made by others within that system"

The actuality of the reason that the researcher uses the term "Social Network Site" is to describe the observable fact, that the term "Social Networking Sites" also appears in public discourse, and the two terms are often used interchangeably. The researcher chose not

to employ the term "Networking" for two motives i.e. Emphasis and Scope.

Networking emphasizes a relationship initiation, and often among strangers wherein Networking is possible on these sites, it is not the primary practice on many of them, nor is it what differentiates them from other forms of computer-mediated communication (**"CMC"**).

What makes these social network sites unique are that they allow users to articulate and make visible their social networks with others and not that they allow individuals to meet strangers and these results in connections between these individuals that would not otherwise normally be made. And on many of the prominent sites the users are not necessarily "Networking" or looking to meet new people whereas, they are primarily communicating with people who they already know and they are in fact a part of their extended social network and due to this critical organizing feature of these sites, they are termed as Social Network Sites (**"SNS"**).

The prominent sites also encourage users to upload a profile photo for displaying on the profile. In the present day scenario, majority of the SNS provide Privacy options for displaying information and the user can control as to what information he would like to share with everyone, what he would like to share only with friends and personalize his profile in terms of security and display as far as possible. SNS's like Orkut, Myspace and Facebook allow its users to enhance the appearance of their profiles by adding multimedia contents like songs and videos and by modifying the profile's look and feel by their choices of colours.

A pertinent reason that Facebook started slow and suddenly shot to being a force to be reckoned with was that the ideology of Mark Zuckerberg was to change from the traditional concept and move to the new era. Facebook was the first site that allowed its user to add modules **("Applications")** all sorts to make the site more addictive and fun.[1] An application called as Farmville which was added to the Facebook profile is one such example. This application was launched in the June 2009 and after its presence it was reported by London Today that users on Facebook come back three times a day only to play the game and that Farmville Farmers are 10:1 to the Real American Farmers.[2] These additions are one of the primary reasons that SNSs really achieved a stand in the modern day society.

The visibility of a profile varies by site and according to user discretion. By default, profiles on Orkut are crawled by search engines, making them visible to anyone, regardless of whether or not the viewer has an account. Whereas, Facebook takes an alternative approach and by default, allows users who are part of the same "Network" to view each other's profiles, unless a profile owner has decided to deny permission to the people in their network. These structural distinctions are one of the reasons that SNSs differentiate themselves from one another.

After making a profile on these SNSs, users are encouraged to identify others in the same system with whom they have or might have a relationship and to send invitations to those who still aren't in the system. The labels of these relationships differs from site to site, these labels could be terms likes "Friends", "Contacts" or "Fans". The majority of the SNSs require bi-directional or dual confirmation for Friendship i.e. both users have to acknowledge that they know each other whereas some don't. These one-directional ties are labelled as "Fans" or "Followers" as primarily seen in Twitter but various sites call these ties Friends as well.

The public display of connections is a crucial component of SNSs as the list contains links to other user's profile and by this a user expands his network of Friends. On most sites, the Friend List is visible to anyone who is permitted to view the profile by the user, although there are some exceptions. For instance, Facebook and Orkut allow users to opt out of displaying their profiles.

Most of the SNSs provide a means for users to leave messages on their Friends' profiles. This feature usually involves leaving "Scraps" or "Comments". In addition to this form of communication many SNSs also have a private messaging feature similar to webmail or messenger chat where both private messages and comments are made. Besides and beyond Profiles, Friends, Comments and Private Messaging SNSs vary greatly in their features and their user base. Some have photo-sharing or video-sharing competencies others have built-in microblogging and some have instant messaging technology. While SNSs are designed to be widely accessible, so it is not rare to find groups using sites to segregate themselves by nationality, age, educational level, or other factors.

Impact: Social Networking Sites were not less than a revolution upon their commencement. People were so easily attracted because it made relationships reach another level. People could connect virtually with everyone they knew instantly and could keep in touch and updated about their friends and family regardless to their physical position on the planet.

In India there is an old story of two brothers who get lost in a *'Kumb Ka Mela'* and reunite after 14 years, this situation now would never happen as he could just look his brother on the net in a second. The perception has not entirely changed of how people connect and how they meet. Sites like Facebook and Twitter not only hooked children but people from all various and diverse age groups. Bollywood stars and icons like Barack Obama connect to their followers by tweets and give their views and thoughts. These sites have made such an impression on the young and the old that perception between the Real and Virtual world has now a very thin line minuscule difference.

Legal Issues: In terms of business, members may use social networks for professional development to supplement face-to-face networking, to describe business efforts and opportunities or seek advice or opinions by asking questions to the social network community. Organizations may utilize social networks to disseminate "*Press Release*" type information and may link back to their own website for additional details. Promoting events on Facebook can result in more rapid, widespread coverage than an organization could obtain anywhere else as notifications are sent to all of a member's friends when that member RSVP'S for an event.

Companies may even use social networking to quickly respond to critics, such as recent 'tweets' *(Twitter messages)* by General Motors[3] to help diffuse severe comments by government officials and the media. An even more recent example is Domino's issuance of an apology on www.youtube.com *(YouTube)* in reaction to an earlier video showing two North Carolina based workers engaging in less than hygienic conduct while assembling pizzas.[4]

Social networking activities raise legal issues around content use and infringement, defamation, attribution as well as good old-fashioned tort liability. Social networking sites are also fertile ground for garnering evidence in criminal matters and for other investigatory purposes.

Psychosomatic Impact of Social Media?: Social media has become immensely popular, and in recent year mental disorderliness among young adults has become more common. That doesn't mean they are related but it can't be ruled out that the causes are also not unrelated and the numbers are staggering and deserve attention. Vide a recent survey In 2018, an estimated of 66.7 million adult eighteen or older in the US had a mental unwellness of one type or the another. Young adults aged 18-25 had the highest prevalence of any mental illness at 22.1% compared to adults aged 26-49 at 21.1% and aged 50 and older at 14.5%.[5]

A new phenomena called as "**Facebook/Insta Depression**" is a concern resulting from children's use of social media. A report by the American Academy of Paediatrics defines such a depression as *"depression that develops when teens and preteens spend time on social media web site and then Begin to exhibit classic symptoms of depression due to the intensity of the online world.*" The citron that may contribute to depression are the various measures of popularity that Facebook creates. In particular, Facebook can make kids feel inadequate due to the "in-your-fount" booster tallies, status updates, and moving picture of others having a good time. For well-adjusted kids, however, social media can have the opposite effect, boosting their already positive feelings about themselves.[6]

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The factors that may contribute to depression are the various measures of popularity that Facebook creates. In particular, Facebook can make kids feel inadequate due to the "in-your-face" friend tallies, status updates, and pictures of others having a good time. For well-adjusted kids, however, social media can have the opposite effect, boosting their already positive feelings about themselves. In fact historically speaking the beginning of the idea of the concept of Facebook was earlier developed as a rating app by Zuckerberg along with his friends. In the year 2003, Zuckerberg along with his friends created an online programme called "Facemash", which allowed users to objectify fellow students by comparing photos of their faces and selecting who they deemed as "hotter".

The inception of an already psychological nightmare of young adults and especially young ladies getting rates as "who's hot and who's not" clearly shows the impact on a young person psyche[7].

Even as recent as 2017-18, a game called as The Blue Whale Game/"Blue Whale Challenge", an Internet "game" that claimed to exist in several countries. The game allegedly consists of a series of tasks assigned to players by administrators during a 50-day period, with the final challenge requiring the player to commit suicide. The term "Blue Whale" comes from the phenomenon of beached whales, which is linked to suicide. Blue Whale began in Russia in 2013 with "F57", one of the names of the so-called "death group" of the VKontakte social network, and allegedly caused its first suicide in 2015. Philipp Budeikin, a former psychology student who was expelled from his university, claimed that he invented the game. Budeikin stated that his purpose was to "clean" the society by pushing to suicide those he deemed as having no value and has a result of its various challenges a lot of young adults lost their lives as they committed suicide. A similar situation was seen in the 2018 "Tidepod Challenge".

As indicated by the Pew Research Center, by 2018, 86% of adolescents had cell phones. One brain science educator at San Diego State University found that adolescents who burn through at least 5 hours per day online were 81% bound to have at any rate one hazard factor for suicide contrasted with youngsters who went through just 1 hour daily on the web. The number of social media platforms used and how often they are used is related to youth mental health. A recent study found that the more social media platforms an adolescent uses, the more likely they are to have symptoms of depression and anxiety, regardless of overall time spent on social media.[8]

It is obvious that not all social media sites are healthy environments for adolescents. Intimidation, Bullying, cliques, and sexual experimentation are just as prevalent online as offline. Because children are not good at self-regulation and are susceptible to peer pressure, social media sites can be dangerous places to "hang out" specifically if unsupervised and unregulated. While countries like United States of America and Australia are having specific statutes governing the minimum age to access social media sites is 13 because the Children's Online Privacy Protection Act prohibits websites from collecting information on children younger than 13 without parental permission. However, other countries including India doesn't have till date a legislation regarding such determination of age, the problem is usually on the premise that age is based on self-report, so children younger than 13 can simply lie about their age and open accounts.[9]

While most parents do not fully comprehend social networking sites, one can safely say that most Indian parents don't even consider this a valid issue of discussion within the familyand, with many parents' busy schedules, this leaves many kids unsupervised in the online world, which can lead to problems, which again is something which can and should be addressed and is not. Parental supervision is as valuable online as it is offline in instilling values and safeguards to protect a child and adolescents from Depression, Bullying and for their general well-being again both emotional and physical.

Conclusion

As a conclusion, it is important to understand the real and actual impact of SNS in one daily life and like any other experience in life ought to be monitored by parents, limited by children and adolescents and has to be considered as a valid issue to be discussed by friends and family. Like any real events in life such SNS interaction have far more digging consequence and with the privacy factors far more darker impact in one life which can impact anyone and in any manner.

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Detection of Extended-Spectrum-Beta-Lactamase (ESBL) Producing Escherichia Coli in Meat Chicken from Traditional Market in Surabaya, East Java, Indonesia

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Abstract

This study to detect Extended-Spectrum-Beta-Lactamase (ESBL) – producing *Escherichia coli* (*E. coli*) in chicken meats from traditional market in Surabaya. Total of 60 chicken meat samples from ten traditional markets, with each market contributing 6 samples. The ESBL-producing *E. coli* were tested for susceptibility using disk diffusion method as described by Bauer. The study affirmed the presence of ESBL producing *E. coli* in chicken meats from traditional market Surabaya. The highest resistance from *E. coli isolates* was recorded against ceftriaxone (87%) followed by cefotaxime (75%), aztreonam (70%) and ceftazidime (28,3%).The presence of ESBL producing *E. coli* in the chicken meats is alarming and requires adaptation of hygienic practices and controlling use of antibiotics.

Keywords: *Chicken meats, E. coli, ESBL, traditional market.*

Introduction

Poultry production is one of the most important parts of farm industry in Indonesia. One of the poultry production is chicken meat.In the poultry industry, enteric bacterial pathogens pose a threat to public health and can contribute to the transmission of zoonotic diseases[1][2]. One of the zoonotic diseases is that of the foodborne disease. Food-borne diseases, caused by agents that enter the body through the intake of contaminated food materials are one of the primary public health concerns[3].Food-borne disease remain a major public health problem across the globe. It affects the people's well-being, and imposes economic impacts[4]. ESBL-producing *E.coli* is included in a food-borne disease.

The high consumption of chicken meat requires great care to provide the safety of the industry against menacing factors[5]. Along with development of poultry farms and intensive culture, occurrence of the bacterial diseases and, consequently,overusing antibiotics have been increased in recent years[6].The inappropriate use of antibiotics, not only in human medicine but also in animal husbandry, has been considered a main driver leading to the increase of multidrug-resistant bacteria[7][8].Food-producing animals are known as an important reservoir of antimicrobial-resistant zoonotic bacteria[9].

Beta Lactamases are the most frequent source of resistance to beta lactam antibiotics, and the production of beta lactamaseis the primary mechanism of antibiotic resistance in *Enterobacteriaceae*. Various beta lactamases have been reported, including penicillinases, extended-spectrum beta-lactamases (ESBLs), cephalosporinases (AmpC), metallo-beta-lactamases (MBLs), and carbapenemases (KPCs)[10][11].

Among *Enterobacteriaceae, E. coli*is the species that causes the greatest number of infections and has become the main emergence of extended spectrum beta-lactamase (ESBL) producing bacteria[12]. *E.coli* is a common inhabitant of the vertebrate intestinal tract and a frequent microbial contaminant of retail meat products[13].

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The ESBL-producing *E.coli* in humans and animals has gained global notoriety during the past decade. This comes along with a fiery concern of foodanimals serving as potential reservoirs of ESBL genes [14].The purpose of this study to detect ESBL-producing *E.coli* in chicken meats from traditional market in Surabaya.

Materials and Method

Isolation and Identification of E. coli: A total of 60 chicken meat samples were obtained from 10 traditional markets in Surabaya. From each market, 6 carcasses were collected and from each carcass, 25 g chicken meat samples were homogenized in Buffered Peptone Water (BPW) media (Merck 1.07228.0500) for isolation of *E. coli*, then taking 1 ml suspension into 9 ml of Brilliant Green Bile Broth media (Merck 1.05454.0500) with Durham tube inside, and incubated at 45.5°C for 24-48 h. Gas-produced tube was positive and suspected to be *E. coli.* Taking 1 loop of suspected *E. coli* and inoculated on Eosin Methylene Blue Agar (EMBA) (Merck 1.01347.0500) and then incubated at 35°C for 24 h. All colonies with typical *E. coli* morphology were selected and confirmed by indole, methyl red, Voges–Proskauer, and citrate utilization biochemical tests.

ESBL-producing E. coli Susceptibility Test: The ESBL-producing *E. coli* were tested for susceptibility using disk diffusion method as described by Bauer. Making the bacterial suspension, one or two colonies of *E. coli* were cultured in 5 ml of sterilized NaCl (Natrium Chloride) at 37°C for 24 h and then homogenized using vortex until it was found to be similar to McFarland Standards. 0.2 ml bacterial suspension was inserted into a Petri dish containing Mueller-Hinton Agar (MHA) media (Merck1.05435.0500), then spread over the surface of agar using the sterile glass spreader carefully rotating the Petri dish at an angle of 45°C at the same time, and waited 15 min to absorb the bacterial suspension.

The ESBL-producing *E. coli* were tested against four beta-lactam antibiotics which included ceftazidime (30 µg), aztreonam (30 µg), cefotaxime (30 µg), and ceftriaxone (30 µg). The diameters of inhibition zones were measured and interpreted as per the guidelines of the Clinical and Laboratory Standards Institute [15]. The data were presented descriptively in the form of tables as percentages.

Findings: A total of 60 chicken meat samples were included in this study (mean weight 25 g). The results of *E. coli* isolation and identification from chicken meat samples revealed that 54 samples(90,03%) were positive. It is similar with Davis *et al*[16]where are chicken products (87.6%) were contaminated with *E. coli*in United States and similar with the findings of Patyal *et al*[17], who reported 68% prevalence rate of *E. coli* in Jaipur, Rajasthan, India. Sharma and Bist[18] also reported 70% prevalence rate *E. coli* in chicken meat in Mathura city of Uttar Pradesh, India.

Bacteria in food-producing animals are spread through the food chain[19].The high level of *E. coli* in meat might be caused by several factors including *E. coli* which is a normal flora in animal intestine so itis possible that the meat may come in contact with fecal contaminants [20][21].

Presence of pathogenic strains of *E. coli* in poultry meat is not only a potential threat of cross contamination but can also lead to become an infectious dose for handlers and consumers. *E. coli* presence in food materials are considered to be an indicator for the presence of other pathogenic bacteria in the respective food items[22].

The presumptive ESBL-producing *E. coli* isolates were tested for susceptibility against ceftriaxone (30 µg), cefotaxime (30 µg), aztreonam (30 µg)and ceftazidime (30 µg). According to our results from table 2, highest resistance from *E. coli* isolates from 60 chicken meat samples was recorded against ceftriaxone (87%) followed by cefotaxime (75%), aztreonam (70%) and ceftazidime (28,3%). These finding is agrees with Kwoji *et al*[23] where are similar higher resistance to ceftriaxone (96.9%) and aztreonam (98.5%) but contrast with ceftazidime (93.8%).For cefotaxime (75%) is contrast with Gundogan and Avci[24] where lower resistance to cefotaxime (33.3%) reported.

With regard to antibiotic resistance, methicillin-resistant staphylococci, in particular MRSA, and ESBL-producing *Enterobacteriaceae* are currently of special concern. In recent years, it has been widely recognized that the dissemination of MRSA and ESBL-producing bacteria is an issue no longer restricted to the medical/health care system [25–28].The emergence of ESBL producing *E. coli* in the food-producing animals and in foods of animal origin is a growing problem worldwide[29].

Wang *et al* found residues of antimicrobials in chicken meat and even detected some human antimicrobials, that are not usedas veterinary drugs. The

spread of antimicrobial resistance genes in poultry may be associated with the prophylactic use of cephalosporins injected into eggs to control *E. coli* omphalitis in broiler chickens[30]. The production of extended-spectrum beta-lactamases (ESBLs) is the worldwide most important mechanism conferring resistance to 3rd generation cephalosporins in *E. coli*[31][32].

Doi *et al*. reported that 67% of retail meat samples in Seville, Spain, contained ESBL or ESBL-like resistance genes[33]. A survey of imported raw chicken in the United Kingdom reported ESBL genes in 10 of 27 samples[34]. In fact, Gregova showed that the occurrence of ESBLs in chicken meat could be related to the environmental microbes of the slaughterhouse,to the processes of scalding, defeathering, and evisceration, and to that the bacteria can be transferred from chickens because of the contact through water and incorrect cleaning and disinfecting[35].

Considering what is known about the epidemiology of *E. coli*, the abundance of ESBL genes in chicken meat is a likely explanation for current findings in humans. Although there are extensive campaigns promoting safe handling of chicken meat during processing, enteric pathogens are frequently transferred to humans and pose a continuous public health threat[36].The high antibiotic resistance among *E. coli* recorded in this present study might be due to uncontrolled administration of antibiotics to chickens in Indonesia farms.

Table 1. E. coli isolation from chicken meat obtained from traditional market in Surabaya

Market	E. coli		Positive Percentage (%)
	Positive	Negative	
A	6	0	100
B	6	0	100
C	5	1	83,3
D	3	3	50
E	4	2	67
F	6	0	100
G	6	0	100
H	6	0	100
I	6	0	100
J	6	0	100
Mean of E. coli Positive			90,03%

Table 2. Data of ESBL from chicken meat obtained from traditional market in Surabaya

Antibiotics	ESBL Production		Positive Percentage (%)
	Positive	Negative	
Ceftriaxone	53	7	87
Cefotaxime	45	15	75
Aztreonam	42	18	70
Ceftazidime	17	43	28,3

Conclusion

The study affirmed the presence of ESBL producing *E. coli* in chicken meats from traditional market in the study area.It can be concluded that highest resistance from *E. coli* isolates to third-generation cephalosporinswas recorded against ceftriaxone (87%), cefotaxime (75%), aztreonam (70%) and ceftazidime (28,3%) out of 60 samples.

Conflict of Interest: The authors declare that they have no conflict of interest.

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Ethical Clearance: Ethical approval for animal research was not required as live animals were not used in this study. Meat samples were purchased from market.

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Health Problems of Prospective Brides in Rural Area of East Java, Indonesia

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Abstract

Background: Health conditions of prospective brides were very important to identify before marriage because they will be "the main actors" in reproduction process of the next generation.

Objectives: The objectives was to describe the health problems of prospective brides in rural area, East Java, Indonesia.

Materials and Method: The study was an observational study. Samples of this research were all prospective brides and grooms who had been registered in nine Religious Affairs Office and nine Public Health Center in Proboling go through Pre-Marital Integrated Services by using Laduni cards in 2015. Variables under the study were consists of some demographic and health variables. Data processing and analysis were did descriptively based on the results of cross tables.

Results: Anemia tends to be more prevalent on the younger age group as well as the Body Mass Index status <18.5 and Less Energy Calories. Hip Waist Ratio>0.85 had a high enough percentage in all age groups.

Conclusions: There were many prospective brides who did not use contraception but also they did not want to have the children within one year of marriage. Anemia, underweight BMI status and Chronic Energy Malnutrition have more occur on younger age group, while the older age group have more high risk of degenerative diseases.

Keywords: *Health problem, contraceptive use, nutrition status, prospective brides, rural area.*

Introduction

Forming a happy and prosperous family as mandated by Indonesian Law No. 1 of 1974 was not a simple matter. While health conditions of prospective brides were very important to identify before marriage because they will be"the main actors" in reproduction process of the next generation. Women can be analogized as "factory as well as provider of raw materials" for the future generations. When the factory and the raw materials were not well prepared, then the future generation that will be produced will be perfunctory quality, just life but not qualified[(1)].

A number of medical examination procedures were essential for prospective brides. Blood pressure checks were necessary to anticipate the early presence of abnormal blood pressure (hypertension or hypotension) and to predict of cardiovascular disease as other indices[(2)]before prospective brides become a mother. Examination of hemoglobin blood was very useful to know whether prospective brides anemia or not[(3)]. If prospective brides was anemic then if she becomes pregnant,it will be more severe because of pregnancy can decrease hemoglobin levels up to 1.5 mg/dl from the initial conditions before pregnancy. Measurement of body weight and height was needed to calculate Body Mass Index (BMI). BMI shown a person's nutritional

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status[4]. Maternal weight before pregnancy was a risk factor for low birth weight[5]. Moreover, the cause of perinatal death was thought to be related to maternal underweight status[6].The use of contraception indicates the level of contraceptive use to delay pregnancy after marriage. The desire to have children indicates potential of average age of women at the first childbirth. While the nutritional status of prospective brides will greatly affect to the quality of pregnancy and the children to be born[7].

Materials and Method

The study was an observational study, while the design of the study was a descriptive research design. The research location was at Probollinggo District, East Java Province, Indonesia.

Population of this research were all prospective brides and grooms who have been registered in nine Religious Affairs Office (RAO) and nine Public Health Center (PHC) in Probolinggo through Pre-Marital Integrated Services by using Laduni cards in 2015. Samples in this study are all of the population that consist of 774 pairs of prospective brides and the grooms that recorded in the nine RAO in Probolinggo. In general, candidates were listed on RAO wedding where prospective brides resides.

Variables that observed in this study were blood pressure, hemoglobin level, pregnancy test, Tetanus Toxoid immunization, contraceptives use, desire to have children within one year of marriage, anthropometry comprising Upper Arm Circumference (MUAC), Body Mass Index (BMI) and Waist Circumference Pelvic Ratio (waist hip ratio) to determine the nutritional status. Data processing and analysis were did descriptively using frequency distributions and cross tables.

The data collection technique used in this study was to use secondary data from the results of the prospective brides registration conducted by nine of the Office of Religious Affairs and the premarital health examination conducted by nine of the Public Health Center in each sub-district in Probolinggo District, East Java Province, Indonesia. While the data analysis was carried out descriptively based on the results of cross table analysis.

Results

Health and Nutritional problems of prospective brides: There were a number of Laduni form not filled completely or empty, so that left nearly all of the observed variables not had the same total number. Most of the prospective brides had normal blood pressure, even though there were few of the prospective brides of the prospective brides had hypotension, hypertension, and pre-hypertension. Based on the results of the pregnancy test it was known that as many as 11.6% of the prospective brides already pregnant. Almost all of prospective brides who got Tetanus Toxoid immunization (TT).Prospective brides who were not immunized TT, it was because they were unwilling or afraid of TT immunization for various reasons.

Prospective brides who already used contraception before fist pregnancy were quite a lot. Prospective brides who had been using contraception were those who have not done the wedding ceremony nor had the wedding ceremony, but had not registered marriage in the RAO. However, many prospective brides who did not use contraception said that they wanted to use contraception after the wedding ceremony. The type of contraception that most preferred by prospective brides were injection contraception and Pill. The injection contraception lot of interest since its use once every 3 months. As for those who choose birth control pills usually because they were easily stopped to used it at any time. Prospective brides that states did not want have a child in one year after the marriage were more than a half. This was contradiction with the fact that the prospective brides who wearing contraception were less than prospective brides who did not want to get pregnant within the first year of their marriage (Table 1).

Table 1: Cross tabulation of age group by contraceptive use before marriage and plan to have children within one year after marriage on prospective brides in Probolinggo district, East Java Province, Indonesia

Contraceptive use before marriage	Plans to have children within one year after marriage				Total	
	Yes		No			
	n	%	n	%	n	%
Yes	25	8.8	259	91.2	284	100.0
No	226	59.3	155	40.7	381	100.0
Total	**251**	**37.7**	**414**	**62.3**	**665**	**100.0**

Source: Laduni cards, 2015

Most of the prospective brides known anemic. The average Hb level of the prospective brides was 11.5 g/dl, with a minimum value of hemoglobin level was 5.9 g/dl and a maximum was 18.5 g/dl. The anemic was highest in the youngest age group (15-19 years) (Table 2).

Table 2: Cross tabulation of age group by hemoglobin level (Hb) on prospective brides in Probolinggo district, East Java Province, Indonesia.

Age Group	Hemoglobin Level (Hb)				Total	
	Normal (>12g/dl)		Anemia (<12 g/dl)			
	n	%	n	%	n	%
15 - 19	154	41.7	215	58.3	369	100.0
20 - 49	142	47.3	158	52.7	300	100.0
Total	**296**	**44.2**	**373**	**55.8**	**669**	**100.0**

Source: Laduni cards, 2015

Prospective brides who had nutritional status based on value of the Body Mass Index (BMI) were quite a lot. The nutritional status of the prospective brides by BMI showed a tendency of the young age of the bride getting underweight. Conversely the adult age group of the prospective brides, tends to increase the BMI (Table 3).

Table 3: Distribution age group with BMI status on prospective brides in Probolinggo, East Java Province, Indonesia.

Age Group	BMI status								Total	
	Underweight (<18.5)		Normal (18.5 to 25)		Excess Weight Loss (25 to 30)		Overweight (> 30)			
	n	%	n	%	n	%	n	%	n	%
15 - 19	137	35.0	224	57.3	26	6.7	4	1.0	391	100.0
20 - 49	87	26.8	203	62.4	26	8.0	9	2.8	325	100.0
Total	**224**	**31.3**	**427**	**59.6**	**52**	**7.3**	**13**	**1.8**	**716**	**100.0**

Source: Laduni cards, 2015

Based on the ratio of waist circumference pelvis known that more than a quarter of prospective brides have a higher risk of degenerative diseases. In every age group was relatively almost no difference in the value of waist hip ratio (Waist Pelvic Ratio) between high risk and not high risk. However there was a slight tendency, increasingly older age group more high risk of degenerative diseases (Table 4).

Table 4: Distribution age group with pelvic waist circumference ratio (waist hip ratio) on the prospective bride in Probolinggo, East Java Province.

Age Group	Pelvic Waist Circumference Ratio				Total	
	High risk (> 0.85)		Not high risk (<0.85)			
	n	%	n	%	n	%
15 - 19	96	26.2	271	73.8	367	100.0
20 - 49	89	31.4	194	68.6	283	100.0
Total	**185**	**28.5**	**465**	**71.5**	**650**	**100.0**

Source: Laduni cards, 2015

Measurements of Middle Upper Arm Circumference (MUAC) showed that a lotof the prospective brides had chronic energy deficiency. In all age groups were also relatively almost no difference value of MUAC of the prospective brides between chronic energy deficiency and normal. However, there was a tendency of younger age group of the prospective brides had the higher percentage of Less Energy Calories (LEC) (Table 5).

Table 5: Distribution age group with Median Upper Arm Circumference (MUAC) on the prospective bride in Probolinggo, East Java Province.

Age Group	MUAC				Total	
	Chronic energy deficiency (<23.5 cm)		Normal (> 23.5 cm)			
	n	%	n	%	n	%
15 - 19	134	37.6	222	62.4	356	100.0
20 - 49	63	34.8	118	65.2	181	100.0
Total	**225**	**35.1**	**416**	**64.9**	**641**	**100.0**

Source: Laduni cards, 2015

Discussion

The type of contraception that most preferred by prospective brides were injection contraception and Pill. Injections most desirable because it had no effect on weight gain which was not favored by women. While the pill even though it can give the effect of weight gain, but its use can be discontinued at any time[8].

Most of prospective brides that states do not want have a child in one year after the marriage. DHS in 52 countries between 2005 and 2014 reveal the most common reason that married women say they do not want to get pregnant but do not use contraception, was due to fear of side effects and health risks, rarely having sex or not at all; they or others close to them oppose contraception; and they breast-fed and/or did not continue menstruating after birth[9]. According to DHS survey results unmet need was usually higher in rural areas than in urban areas and it declines with educational attainment[10].

Most of the prospective brides were anemic. Studies in India showing one cause of iron-deficiency anemia (IDA) in rural women of childbearing age was younger age at marriage (<19 years)[11]. The other study found the net prevalence of severe/moderate anemia was higher among women whose age at marriage was<18 years than women married inhigher age groups[12].

Prospective brides who had BMI were underweight more than half. A low BMI before pregnancy would increase the risk of preterm birth and Intrauterine Growth Retardation (IUGR) of the fetus in the womb[13]. Women who were overweight before pregnancy generally would be less weight gain during pregnancy than women who were underweight[14]. Mothers with low BMI before pregnancy had greater risk of delivering low birth weight infants and spontaneous preterm birth[15]. Compared to women with a normal pre-pregnancy BMI, women who were underweight had over twice the odds of PTD. While, neither overweight nor obesity was significantly associated with increased odds of PTD[16].

While based on the ratio of waist circumference pelvis of prospective brides known that quite a lot of them had a higher risk of degenerative diseases. Pelvic waist circumference ratio values >0.85 for women would associated with an increased risk of degenerative diseases such as coronary heart disease, stroke, and diabetes mellitus type-2[17].

MUAC measurements were performed on prospective brides showed that a lot of them had chronic energy deficiency. Weight before pregnancy was a good predictor of weight babies born. Researchers from India have found that maternal nutritional status can significantly affect the weight of newborns and poor mother's nutritional status can lead to LBW[18]. Another study also from India also find the same result that widespread maternal under nutrition has led to LBW[19].

Conclusions

Most of prospective brides married at the age between 15-19 years old, only graduated from primary

school or less, nearly half of all prospective brides do not work. There were a lot of prospective brides who did not used contraception states that did not wanted to have the children in the first year of their marriage. There wasa tendency that anemia, underweight BMI status and Chronic Energy Malnutrition (CEM) more occur on the younger age (15-19) of prospective brides. There was a tendency, increasingly older age group of prospective brides, the more high risk of degenerative diseases.

Ethical Clearance: The research has been stated to meet the ethical eligibility by the Ethical Clearance Research Team of Medicine and Health Gajah Mada University, Yogyakarta, Indonesia with number: KE/KF/202/EC

Competing Interest: The authors declare that there are no competing interests **to disclose.**

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Cytotoxic Activity and Selectivity Index of Solanum Torvum Fruit on T47D Breast

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Abstract

Solanum torvum has antioksidan. This study aimed to analyse cytotoxic activity and selectivity index of *Solanum torvum* on T47D breast cancer cells invitro. Identification of *Solanum torvum* fruit chemical compounds with LCMS containing Clorogenic acid, 4-O-caffeoylquinic acid, 3-O-caffeoylquinic acid, 3-O-feruloyquinic acid, 5-O-feruloylquinic acid, 3-O-feruloylquinic acid, 3,4 - O dicaffeoylquinic acid, 3,5-dicaffeoylquinic acid, 3-O-feruloylquinic acid, 5-O-feruloylquinic acid, putative dicaffeoylquinic lactone. Cytotoxic assays showed that the *Solanum torvum* Without Fermentation were IC_{50} (IGT) 1111.62µg/mL, IC_{50} (MGT)1889.20µg/mL, IC_{50} (EGT) 1171.90µg/mL, IC_{50} (FEGT) 305.98 µg/mL. Cytotoxic assays showed thatthe treatment of fermentation was IC_{50} (IBT) 1760.36 µg/mL, IC_{50} (MBT) 1631.06 µg/mL, IC_{50} (EBT) of 1111.58 µg/mL, IC_{50} (FEBT) 39.17µg/mL, IC_{50} (FHBT) 85.58 µg/mL. Index of selectivity (IS) *Solanum torvum* (without fermentation) were IS (IGT) 5.23, IS (MGT) 0.61, IS (EGT) 1.06, IS (FEGT) 1.45. Index of selectivity of *Solanum torvum* (fermentation treatment) were IS (IBT) 2.41, IS (MBT) 0.78, IS (EBT) 0.18, IS (FEBT) 4.64, IS (FHBT) 1.67. The best results are treatment of ethyl acetate fraction of *Solanum torvum*(FEBT) has IC_{50} was 39.17 µg/mL and Index selectivity was 4.64, declared safe/not toxic to normal cells, thus potentially developed as T47D breast anticancer cells.

Keywords: *Cytotoxic, T47D Breast Cells, Selectivity Index, Solanum torvum.*

Introduction

Solanum torvum in Indonesia in fertile soils has antioksidan. *Solanum torvum* contains steroids, terpenoids, saponins, tannins, alkaloids, fatty acids, 3-o-acetyl-stigmasta-5,25-diene-2,3-diol, methyl stearate, 21,25-dimethylmelianodiol[(1)]. *Solanum torvum* extraction on seeds and fruit peel has compounds of flavonoids, sterols and saponins[(2)]. Solanum torvum has alkaloids, flavonoids, saponins, tannins, glycosisides[(3)]. *Solanum torvum* has constituent chemicals such as neochlorogenin 6-O-β-D-quinovo-pyranoside, neochlorogenin 6-O-β-D-xylopyranosyl- (1 → 3) -β-D-quinovopyranoside, 6-O-α-L -rhamnopyranosyl- (1 → 3) -Dbeta quinovopyranoside, solagenin 6-O-β-D-quinovopyranoside, solagenin 6-O-α-L-rhamnopyranosyl (1 → 3) -β-D-quinovopyranoside, isoque-rcetin, routine, kaempferol and quercetin[(4)]. The wild eggplant fruit (Solanum torvum) in Indonesia was relatively used by the population because ithas not been cultivated .*Solanum torvum* containing sesquiterpen functions immunosuppressive[(5)]. Clorogenic acid serves to prevent and treat anti-inflammatory diseases[(6)]. Chlorogenic acid is a polyphenol compound proven to stimulate anti-inflammatory, antibacterial and antioxidant activities as agents for clinical treatment of hepatic I/R injuries[(7)]. Carcinogenesis is the process of the occurrence of multi-stage cancer that undergoes genetic changes and progressive transformation of normal cells into malignant cells[(8)]. The biggest cancer causes of death in the world are breast, cervix, colon, lung and stomach cancer[(9)]. The most common causes of death for women are cervical cancer and breast cancer. T47D breast cancer cells used in this study

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have unlimited replication ability, high homogeneity and was easily replaced with frozen stock in the event of contamination[10]. This was supported by research that states that the methyl cafeat compound in Solanum torvum fruit functions as an anti-cancer[11]. The study aimed to analyze antioxidant compounds found in *Solanum torvum* fruit extracted with various solvents to function as cytotoxic and selectivity index for T47D breast cancer cells.

Materials and Method

Solanum Torvum: *Solanum torvum* was obtained from Sumber Manjing village Malang . Fruit wild eggplant was sorted, washed, drained. In the next stage processing into dry powder using 2 types of treatment. Treatment 1 was the fruit that has been cleaned in a small chunk and then vacuum dryer temperature 50^0 C for 14 hours. The two treatments were fermented, namely 5 days curing, 6.18 hours fermentation time, 50^0 C drying temperature and 14 hours drying time, thus there stored on main raw material.

Chemical Materials: Materials include, water, aquabides, methanol pa, ethanol pa, n hexane pa, ethyl acetate (p.a.), DMSO, alcohol, T47D cells and vero cells,RPMI, M199 media, FBS, PS, trypsin-EDTA, SDS in 0.01 N HCL, MTT, and PBS, Rnase, ethanol, 2 N hydrochloric acid, lead (II) acetate 0.4 M, isopropanol, chloroform, Molish, 2 N hydrochloric acid, iron (III) chloride reagent, Liebermann-Burchard, n-hexan, DPPH 0.1 mM, methanol, Folin-Ciocalteai, Gallic Acid, AICI3, Quercetin, Sodium Nitrite, Diethyl ether, Na2CO3. Chemicals obtained from the parsitology laboratory of the UGM medical faculty jogjakarta.

Analyzing Solanum Torvum using LCMS: UHPLC The brand of ACCELLA type 1250 made by Thermo Scientific which consists of vacuum degassers. Solvents A = 0.1% wet format in water and B = formic acid in Acetonitrile. A mobile phase gradient with a speed of 300 µl/minute with the following settings: 0.0-0.6.00 minutes 5% B, 0.6 - 3.0. is 2 µL at 160^0C. The column is controlled at 30ºC, and the autosampler compartment is set to 16ºC. UseLCMS/MS Triple minutes 75% B, 3.0 - 3.5 minutes 75% B, 4.0- 5.5 minutes 5%. The injection volume in the TSQ Quantum Access Max spectromethermic acid LC from Thermo Finnigan with an ESI ionization source is controlled by TSQ Tune software which is operated in negative mode. The ionization conditions of ESI are as follows: 3.0 kV spray voltage; evaporation temperature of 250ºC; capillary temperature of 300ºC; nitrogen as sheath gas pressure 40 psi, and 10 psi pressure aux gas with argon gas (12)

Preparation of breast cancer cellsT47D (13):

Ethanolextraction: Samples weighed 10 grams plus 80% ethanol as much as 100 ml then placed on elenmeyer diprasi for 24 hours while being shaken. The results of the extract were filtered put in an impermeable container, the sample was again macerated with 80% ethanol solvent which was repeated until 3 times. The results of the ethanol extract put together are concentrated with a rotary evaporator vacuum temperature of 40^0C until concentrated, then stored in bottles that are impermeable to drying with nitrogen gas until the solvent evaporates, stored in a safe place.

Methanol Extraction: 10 grams of the test sample were extracted with 100 ml of methanol concentration of 95% with 24-hour maceration. The extract was filtered with Whatman no 1 filter paper. Then evaporator until thick and with nitrogen gas until dry, stored in a safe place.

Water Extraction: 10 grams of the test sample were each extracted with 100 ml of hot water in an infusion pan for 15 minutes. The extract was filtered with Whatman filter paper No. 1. The dirotarievapore extract until thick and the results stored in a bottle then dried with frezee drying, stored in a safe place.

Hexane Fractionation: Ethanol extract of Solanum torvum fruit powder was inserted in a separating funnel, added hexane and water each 50 ml (1: 1) shaken so that 2 layers were formed. The hexane layer is collected, the water layer is extracted again with hexane up to 3 times. The results are applied with a vacuum rotary evaporator until thick and dried with nitrogen gas so that stored in a safe place.

Ethyl Acetate Fractionation: Ethanol extract of the test sample was put in a separating funnel added with ethyl acetate and 50 ml (1: 1) of water each shaken to form 2 layers. Ethyl acetate layer is accommodated, the water layer is extracted again with ethyl acetate up to 3 times. The results are applied with a vacuum evaporator until thick and dried with nitrogen gas, thus stored in a safe place.

Citotoxic analysis via MTT: Citotoxic analysis

inT47D breast cells with 9 samples treatment *Solanum torvum* were 31,25 ppm, 62,5 ppm, 125 ppm, 250 ppm, 1000 ppm with ELISA *reader* (Bencmark Bio Rad), wavelength 595[13].

Index Selectivity Analysis: The principle works the same as cytotoxic analysis but the complete media uses M199. The test sample concentrations were 1000ppm, 500ppm, 250ppm, 125 ppm, 6.25 ppm, 31.125 ppm. The results of Selectivity Index formula was (13).

$$\text{Selectivity Index} = IC_{50} \text{ Cells Vero}/IC_{50} \text{ Cells T47D}$$

Result

Identification of chromatographic chemical compounds with LCMS: The results of the identification of chemical compounds in the Solanum torvum fruit (without fermentationtreatment) can be seen in Figure 2 and Table 1.

Table 1: Chemical components of Solanum torvum

No	TR	(M- H)- (m/z)	MS^2 (m/z)	Compounds
1	3,72	353	191,127	chlorogenic acid
2	4,46	353	173,179	4-O- caffeoylquinic
3	3,9	353	191,179	3-O- caffeoylquinic
4	5,00	367	193,191	3-O-feruloylquinic acid
5	5,54	367	191	5-O-feruloylquinic acid
6	5,03	367	193	3,4-O-dicaffeoylquinic acid
7	7,01	515	353	3,4-O-dicaffeoylquinic acid
8	7,19	515	353	3,5-O-dicaffeoylquinic acid
9	7,37	529	367	3-O-feruloylquinic acid
10	7,54	529	367	5-O-feruloylquinic acid
11	7,87	497	335	putative dicaffeoylquinic lactone

In Table 3, it shows the identification of chemical compounds using the LCMS (With Fermentation treatment)

Table 2: Chemical components of fruit Solanum torvum

No	TR	(M- H)- (m/z)	MS^2 (m/z)	Compounds
1	3,69	353	191	Clorogenic acid
2	4,46	353	179	4-O- caffeoylquinic acid
3	3,9	353	179	3-O-caffeoylquinic acid
4	5,03	367	191	3-O-feruloylquinic acid
5	5,54	367	191	5-O-feruloyquinic acid
6	4,67	367	193	3-O-feruloylquinic acid
7	7,01	515	353	3,4,O- dicaffeoylquinic acid
8	7,34	515	353	3,5-O-dicaffeoylquinic acid
9	7,31	529	367	3- O- feruloylquinic acid
10	2,8	529	367	5-O- feruloylquinic acid
11	7,34	497	355	putative dicaffeoylquinic lactone

Cytotoxic Analysis Results of Solanum torvum: In the cytotoxic test samples on T47D breast cancer cells in Table 4.

Table 3: Cytotoxic Test Data on T47D breast cancer cells

Sample testing		IC 50 (µg/mL)
1.	Infusion of Solanum torvum fruit powder (without fermentation) IGT	1111,62
2.	Methanol extract of Solanum torvum fruit (without fermentation) MGT	1889,20
3.	Ethanol extract of Solanum torvum fruit (without fermentation) EGT	1171,90
4.	Ethyl acetate fraction of Solanum torvum fruit (without fermentation) FEGT	305,98
5.	Solanum torvum fruit infusion (fermentation treatment)IBT	1760,36
6.	Methanol Extract of Solanum torvum Fruit (Fermentation Treatment) MBT	1631,06
7.	Ethanol Extract of Solanum torvum Fruit (Fermentation Treatment) EBT	1111,58
8.	Ethyl Acetate Fraction of Solanum torvum Fruit (Fermentation Treatment) FEBT	39,17
9.	Solanum torvum Fruit Hexane Fraction (Fermentation Treatment) FHBT	85,58
10.	Doxorubucin (Cancer Drug)	36,76

Solanum torvum Selectivity Index Results: The results of a good and non-toxic objectivity test for normal cells were infusion of Solanum torvum without fermentation treatment with index selectivity of 5.23 and ethyl acetate fraction of Solanum torvum fermentation treatment having a selectivity index of 4.64, can be seen in Table 5.

Table 4: Index test data on the selectivity

Sample Testing		Selectivity Index	Remarks
1	Infusion of Solanum torvum (without fermentation) IGT	5,23	Selective
2	Methanol extract of Solanum torvum (without fermentation) MGT	0,61	Non-Selective
3	Ethanol extract of Solanum torvum fruit (without fermentation) EGT	1,06	Non-Selective
4	Ethyl acetate fraction of Solanum torvum fruit (without fermentation) FEGT	1,45	Non-Selective
5	Infusion Solanum torvum fruit (fermentation treatment) IBT	2,41	Non-Selective
6	Methanol Extract of Solanum torvum Fruit (Fermentation Treatment) MBT	0,78	Non-Selective
7	Ethanol Extract of Solanum torvum Fruit (Fermentation Treatment) EGT	0,18	Non-Selective
8	Ethyl Acetate Fraction of Solanum torvum Fruit (Fermentation Treatment) FEBT	4,64	Selective
9	Solanum torvum Fruit Hexane Fraction (Fermentation Treatment) FHBT	1,67	Non-Selective

Discussion

Identification of *Solanum torvum* fruit chemical compounds with LCMS containing Clorogenic acid, 4-O-caffeoylquinic acid, 3-O-caffeoylquinic acid, 3-O-feruloyquinic acid, 5-O-feruloylquinic acid, 3-O-feruloylquinic acid, 3,4 - O dicaffeoylquinic acid, 3,5-dicaffeoylquinic acid, 3-O-feruloylquinic acid, 5-O-feruloylquinic acid, putative dicaffeoylquinic lactone. This was supported by opinions[14] The results of phytochemical analysis of *Solanum torvum* fruit extraction with organic solvents contained alkaloids, indole alkaloids, saponins glycosides, flavonoids, phenols, sterols, proteins, carbohydrates, alkaloid lepac, vitamin A, Vitamin C, Vitamin E, polyphenols. The results of research that have a good selectivity index are samples IGT and FEBT (Table 5).The selectivity index value greater than 3 indicates that extract is selective and not toxic, and vice versa if the selectivity index is less than 3, meaning that the extract used is not selective and has a toxicity to normal cells [15]. Antioxidants in small concentrations can prevent or slow down the rate of free radical oxidation or lipid oxidation. These antioxidant compounds can function as free radical scavengers, forming complexes with metal elements as antioxidants and functioning as reducing compounds [16]. Antioxidants were useful in preventing tumors and cancer, premature aging [17]. The best cytotoxic activity in this research wasethyl acetate fraction of*Solanum torvum* fruit

(Fermentation Treatment) IC_{50} value of 39,17 µg/mL. Doxorubicin as a positive control has an IC_{50} value of 36.76 µg/mL[18]. A very effective anticancer agent for breast cancer metastesis was doxorubicin [19]. The criteria for compounds that have antiproleferative potential are $IC_{50} \leq 100$ µg/ml [20]. The research Chromatographic analysis of *Solanum torvum* containing Clorogenic acid and derivative. That clorogenic acid functions to prevent and treat anti-inflammatory diseases [21]A new clorogenic oxide called oxovanadium complex has the potential for antioxidant agents and anti cancer (human breast cancer) [22].

Conclusion

The results of Chromatographic analysis containing Clorogenic acid, and derivative. So the best research results as cytotoxic activity of Solanum torvum ethyl acetate fraction having IC_{50} which was 39.17 µg/mL and index selectivity of 4.64 which means it was not toxic to normal cells, thus potentially developed as T47D breast anticancer

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Conflict of Interest Statement: Herevy we declare that the entire authors of this manuscript have no conflict of interest.

Ethical Clearance: This study was approved by the Department of Food Technology Brawijaya University. According to the research ethics, this research has no ethical violation and the process of collecting data was in accordance with experimental ethics.

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The Relationship between Father Involvement with Growth and Social-Emotional Development in Preschool Children

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Abstract

Background: Growth and social-emotional development in preschool children must have cared for parents. Although evidence exists of the association between them, especially mothers' involvement, only a few studies have examined fathers' involvement in parenting.

Method: This research uses Cross sectional study design. It has 106 pairs of fathers and preschool age children selected using consecutive sampling technique. Those fathers complete the questionnaire on father's involvement in parenting and questionnaire on Age Stages Questionnaire Social Emotional (ASQ-SE) based on their child's age. Furthermore, the Z-score is calculated based on the child's Body Weight/Body Height index to assess their growth. The data are analyzed using chi-square test at significance level of $p<0.05$.

Result: Father's involvement in parenting is relatively good at 51.9%. In terms of child growth based on the calculation of Z-score from Body Weight/Body Height index, 77.4% of the children are found to have normal growth. Most of the children have the risk of experiencing socio-emotional issues at 58.5%. In terms of the association between father's involvement in parenting and preschool children's growth,a value of $p>0.05$ is obtained, and in terms of the association between father's involvement in parenting and socio-emotional development of preschool children,a value of $p<0.05$ is obtained.

Conclusion: This research finds that father's involvement in parenting is not associated with preschool age children's growth,yet it has a significant association with preschool age children's socio-emotional development.

Keywords: *Father involvement, parenting, growth, social-emotional, Preschool.*

Introduction

The initial stage of a child's growth and development determines the conditions in the next stages. Preschool is the period when the father's involvement with their children is at peak than when children are still in their infancy or at elementary school.[1] In Indonesia, according to the result of nutritional status monitoring in 2018, it is reported that infants in Indonesia experience growth issues, i.e. being highly thin and thin at 10.2% and obese at 8%.[2] In addition to growth, child development issues are as extremely important for child welfare as social development which plays a role in child's health.[3]

Father's involvement in positive aspects of their child's life will promote positive achievement as well in children at their preschool years.[4] These positive achievements include positive social behavior, nutritional status improvement,[5] and low obesity occurence.[6]

Pleck identifies some components of father's involvement which consist of positive engagement activities, warmth and responsiveness, control along, indirect care, and process responsibility.[7] In developing

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countries, the role of a father in their child's health has not received adequate attention. The role that a father plays in child's growth and development has not been a frequent topic for research. Some studies emphasize that mothers play an important role in their children's live and fathers are treated fairly shallowly by merely emphasizing their economic status on child's health.[8,9]

Therefore, a further study is needed to see the association between father's involvement in parenting and preschool age children's growth and social-emotional development.

Method

Research Design: This research was conducted in the area of Puskesmas Nglipar I, Gunung Kidul Regency on April-May 2019. It used cross sectional study design and its population was all pairs of father and preschool age child in the area of Puskesmas Nglipar I, Gunung Kidul Regency. This research had obtained a clearance from the ethical committee of Medicine, Public Health and Nursing Faculty at Gadjah Mada University under number KE/FK/0380/EC/2019.

Sampling: Pairs of father and preschool age child (3-6 years old) living within the area of Puskesmas Nglipar I and willing to sign the informed consent. The father should be literate (capable of reading and writing). The exclusion criteria in this research were children who had developmental disorders, sych as mental retardation, autism, or cerebral palsy and fathers with physical disability ad mental emotional disorder. To assess the mental emotional disorder, a screening was done using Self-Reporting Questionnaire-20 (SRQ-20)

Instrument:

1. Questionnaire of father's involvement in parenting of preschool children. This questionnaire was prepared by the researcher for the purpose of this research, consisting of 28 statements using Likert scale. From the result of validity test, the construct was declared valid, i.e. r statistic > r table (0.361). From the reliability test result, the value of cronbach's alpha was found to be 0.732 > 0.60. The father's involvement in parenting was divided into 2 categories, namely good (total score ≥ 72) and poor (total score <72).
2. Age and Stage Questionnaire Social Emotional (ASQ:SE): The research used ASQ:SE,particularly questionnaire of 36, 48, and 60 years of age. This questionnaire had been tested for its validity and reliability in Indonesia in Indonesian language by Ariyani (2017). From the validity test, the value of r statistic was (0.241-0.694), which was greater than r table. The reliability test value with cronbach's alpha was 0.743 > 0.60.
3. The instruments used to measure the child's growth status were microtoice as the body height measuring instrument and digital scale as the body weight measuring instrument. The value of Z-score of body weight per body height based on age was calculated using WHO Anthrosoftware.

Procedure: Those fathers who qualified the inclusion and exclusion criteria were given an explanation on the research procedure and asked for their consent by signing an informed consent. The father completed demographic questionnaire, questionnaire on father's involvement in parenting, and the child's growth and development questionnaire according to the child's age as calculated in months by the researcher. The correctly completed questionnaires were then submitted. The child's body height and body weight measurements were done by coming to the schools or posyandu (integrated service post) of the children whose fathers had agreed to be involved in the research.

Statistic: The statistical test used was correlation test, i.e. chi-square test with the level of confidence used being 95%.

Result

106 pairs of fathers and children of 3-5 years old served as the research respondents. Most of them were male (63 or 59.4%). Most of these fathers had higher education (54 or 53.8%). They mostly had formal occupations (64 or 60.4%) and most of their mothers were unemployed at 73.6%. Most of these families had low monthly income at 55.7% or below the City Minimum Wage of Gunung Kidul Regency.

From the completed questionnaire on father's involvement in parenting,it was found that 55 (51.9%) fathers had a good involvement and 51 had a poor involvement, meaning that 48.1% were less involved in parenting. The correlation betweenf father's characteristics and their involvement in parenting could be seen in Table 1.

The result of data analysis showed that father's education variable with a p value of 0.002, mother's

education with a p value of 0.001, mother's occupation with a p value of 0.018, and family income with a p value of 0.017, had significant correlations with father's involvement in parenting.

Table 1: Father's involvement in care based on the characteristics of the respondents

Variable	Father Involvement				p-value
	Well		Less		
	n	%	n	%	
Father Education					
High education	8	100	0	0,0	0,002
Middle education	25	54,3	21	45,7	
Low education	22	42,3	30	57,7	
Mother Education					
High education	10	83,3	2	16,7	0,001
Middle education	24	66,7	12	33,3	
Low education	21	36,2	37	63,8	
Father Occupation					
Government employees	3	100	0	0,0	0,066
Private employees	8	47,1	9	52,9	
Laborer	19	43,2	25	56,8	
Entrepreneur	19	67,9	9	32,1	
The farmer	6	42,9	8	57,1	
Does not work	0	0,0	0	0,0	
Mother Occupation					
Government employees	3	100	0	0,0	0,018
Private employees	2	40,0	3	60,0	
Laborer	6	54,5	5	45,5	
Entrepreneur	9	90,0	1	10,0	
The farmer	4	30,8	9	69,2	
Does not work	31	48,4	33	51,6	
Family Income					
≥1.571.500	42	89,4	5	10,6	0,017
<1.571.500	40	67,8	19	32,2	

Table 2: Growth of Preschoolers based on Respondent Characteristics

Variable	Growth				p-value
	Normal		Abnormal		
	n	%	n	%	
Father Education					
High education	8	100	0	0	0,198
Middle education	33	71,7	13	28,3	
Low education	41	78,8	11	21,2	
Mother Education					
High education	10	83,3	2	16,7	0,409
Middle education	30	83,3	6	16,7	
Low education	42	72,4	16	27,6	
Father Occupation					
Government employees	3	100	0	0,0	0,766
Private employees	13	75,5	4	23,5	
Laborer	34	77,3	10	22,7	
Entrepreneur	22	78,6	6	21,4	
The farmer	10	71,4	4	28,6	
Does not work	0	0,0	0	0,0	

Variable	Growth				p-value
	Normal		Abnormal		
	n	%	n	%	
Mother Occupation					
Government employees	3	100	0	0,0	
Private employees	3	60,0	2	40,0	
Laborer	11	100	0	0,0	0,086
Entrepreneur	8	80,0	2	20,0	
The farmer	8	61,5	5	38,5	
Does not work	49	76,6	15	23,4	
Family Income					
≥1.571.500	42	89,4	5	10,6	0,016
<1.571.500	40	67,8	19	32,2	

Table 3: Emotional Social Development of Preschool Children based on Respondent Characteristics

Variable	Sociat-Emotional Development				p-value
	Not at risk		Risk		
	n	%	n	%	
Father Education					
High education	6	75,0	2	25,0	0,127
Middle education	17	37,0	29	63,0	
Low education	21	40,4	31	58,5	
Mother Education					
High education	7	58,3	5	41,7	0,019
Middle education	20	55,6	16	44,4	
Low education	17	29,3	41	70,7	
Father Occupation					
Government employees	2	66,7	1	33,3	
Private employees	6	35,3	11	64,7	
Laborer	21	47,7	23	52,3	0,177
Entrepreneur	13	46,4	15	53,6	
The farmer	2	14,3	12	85,7	
Does not work	0	0,0	0	0,0	
Mother Occupation					
Government employees	3	100	0	0,0	
Private employees	3	60	2	40,0	
Laborer	2	18,2	9	81,8	0,034
Entrepreneur	6	60,0	4	40,0	
The farmer	3	23,1	10	76,9	
Does not work	27	42,2	37	57,8	
Family Income					
≥1.571.500	24	51,1	23	48,9	0,113
<1.571.500	20	33,9	39	66,1	

The physical growth of preschool age children was measured based on anthropometric method with body weight per body height index. The body weight was measured using a digital scale and the body height was measured using microtoice. From the 106 children measured, 1 child was found highly thin, 14 children were thin, and 9 children were fat. Furthermore, for the purpose of bivariate analysis, those children with growths other than normal one (highly thin, thin, and fat) combined to be an abnormal growth category, hence in the bivariate analysis, the growth variable was divided into 2 categories, i.e. normal and abnormal.

The correlation between father's characteristics and child's growth could be seen in table 2. The data analysis result indicated that the family income variable with a p value of 0.016 had a significant correlation with the child's growth.

.**Table 4. Relationship of Father's Involvment in Parenting with Growth**

Variable		Growth				p-value
		Normal		Abnormal		
		n	%	n	%	
Father Involvement	Well	47	85,5	8	14,5	0,063
	Less	35	68,8	16	31,4	

Table 3 showed the analysis result where the mother education variable with a p value of 0.019 and mother's occupation variable with a p value of 0.034 were found to have a significant correlation with the child's socio-emotional development.

The bivariate analysis result of father's involvement in parenting with preschool age children's growth using Chi-square test could be seen table 4.47 children raised by fathers who were well involved in parenting and 35 children raised by fathers who were poorly involved in parenting were found to have a normal growth. In terms of the children experiencing abnormal growth which was an accumulation of highly thin, thin, and fat ones, 16 of them were raised by those fathers who were poorly involved in parenting and 8 of them were raised by those fathers who were involved well in parenting. From the statistical test result, a significance value of 0.063 (p value> 0.05) was obtained, meaning that there was no correlation between father's involvement in parenting and preschool age children's growth.

Table 5: Relationship of Father's Involvement in Parenting with Social-Emotional Development

Variable		Social-Emotional Development				p-value	Odd Ratio	95% CI
		Not at risk		Risk				
		n	%	n	%			
Father Involvment	Well	33	60,0	22	40,0	0,000	5,455	2,313-12,865
	Less	11	21,6	40	78,4			

Table 5 showed the result of statistical test where a significance value of 0.000 (p-value< 0.05) was obtained, meaning that there was a correlation between father's involvement in parenting and the socio-emotional development in preschool age children.

The value of odd ratio was found to be 5.455,meaning that those children raised by fathers with poor involvement in parenting had 5.455 times risks of having socio-emotional issues than those children raised by fathers with a good involvement in parenting. The confidence interval values range from 2.313 to 12.865,meaning children raised by father's poor involvement had at least 2.313 times and a maximum of 12.865 greater risks of having socio-emotional issues.

Discussion

Most fathers had a good involvement in parenting. Nevertheless, the difference in number of fathers with good and poor involvements was shown not too substantial, i.e. 51.9% had a good involvement and 48.9% had a poor involvement. It was found that father's involvement in parenting had no correlation with child's growth as seen from the body weight per body height status based on the child's age (p value> 0.05).

Child's growth served as a direct impact of the intake of food in a long run and the child's health. The better the quality and quantity of food that the children consumed and their health, the better they will grow. In addition to food intake and disease, parents' presence also played a certain role in the child's growth.

Parenting became an indirect factor in child's growth. The parenting process was not just done by the mother, rather the father also needed to take part. However, the mother played an important role in providing and serving nutritious foods in the family, thus it had an influence on child's growth.[10] Thus, when the father was less involved in parenting,yet the mother could meet this direct factor, then it would allow the child to have a good growth.

This research also found that most children had the risk of encountering socio-emotional development

issues at 58.5%. The analysis in this research showed that father's involvement in parenting had a correlation with socio-emotional development in preschool age children (pvalue = 0.000).

The father played an important role in their child's socio-emotional development and behavior.[11,12] When the father was actively involved in parenting, their children were less likely to have behavioral problems.[13] An improvement to the quantity and quality level of father's involvement gave a positive influence on the child's social and emotional development.[14]Parenting during preschool period significantly influenced the child's social and emotional competence.[15]

Research limitation: This research used cross sectional method. The research result would be better if it used a longitudinal study method to see the father's involvement in parenting from time to time and its influence on the child's growth and social-emotional development.

Conclusion

From the discussion above, it could be concluded that there was no correlation between father's involvement in parenting and preschool children's growth, yet it had a significant correlation with preschool children's socio-emotional development.

Conflict of Interest: None

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Auditory evaluation with Pure Tone Audiometry and DPOAE in Kanamycin Treatment of Multidrug-Resistant Tuberculosis

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Abstract

Background: Kanamycin treatment is mainly used in multidrug-resistant tuberculosis (MDR-TB) patients. Hearing impairment associated along with the treatment leads to be permanently. Audiology assessments and monitoring may benefits to detect early on hearing loss. This study aimed to determine the evaluation of hearing alteration after kanamycin injection in the first month treatment.

Method: We conducted a prospective study, observational longitudinal analytic with pre and post design in patients treated with kanamycin-based regimens in MDR TB Outpatients Pulmonology Department Dr. Soetomo general hospital Surabaya. Assessment of hearing result using Pure Tone Audiometry and DPOAE, compared between baseline data and after 4 weeks treatments. Statistical analysis for hearing threshold and cochlear dysfunction based on overall frequency and specific frequency DPOAE examination, using Wilcoxon ranks test and Mc Nemar test.

Results: A total of 15 patients (8 males and 7 females) with confirmed diagnosis of MDR-TB were included in this study conducted within 3 months in 2018.There were 15 ears represented with based line and compared to 4 weeks after treatment, showed on Audiometry and DPOAE on overall frequencies, found no significant difference ($p > 0.05$), but in DPOAE at frequency of 10,000 Hertz (Hz) was found a significant difference ($p = 0.002$).

Conclusion: DPOAEat high frequency (10,000 Hz) may benefits for early detection on hearing impairment. A baseline data with DPOAE is recommended, besides Audiometry for ototoxicity monitoring in Kanamycin treatment in MDRTB patients.

Keywords: *Audiometry***,** *DPOAE, kanamycin, multi drug resistant tuberculosis.*

Introduction

Hearing loss in patient with *multidrug resistant tuberculosis* (MDR TB) is suspected due to the effects of long-term kanamycin injection, kanamycin is known affected the permanent damage and the ototoxic remain lasting even after several weeks and months of administration.[1]

Drug ototoxic like aminoglycoside ototoxic effects start from the basis of cochlear and raise progressively to the apex of cochlear. This leads to appearance of *sensorineural hearing loss* (SNHL) with high frequency for the first time and gradually affects lower frequency.[3,4] Ototoxicity might be without any clinical manifestations on weeks, months, or years after stop or finish the therapy.[5] The hearing damage can be tested using several tools like pure tone audiometry and *otoacoustic emission* (OAE) especially to evaluated the damage of cochlear outer hair cell function.[2]

Peloquin *et al,* described the use of kanamycin given both daily and three times a week. They found that the size or frequency of dosage did not affect toxicity. MDR TB patients experience hearing dysfunction after 5 weeks and weeks.[6]Meanwhile, Sharma *et al*., reported only 18 out of 100 MDR-TB patients who received kanamycin after 6 weeks[7]. Pure tone audiometry examination showed that most of patient are having hearing loss on

≥ 2,000 Hz frequency with a hearing threshold of ≥ 20 decibels (dB).[6] The ototoxicity of TB MDR patients begin affecting high frequency and followed by lower frequncy in the end of second week.[8]

The aimed of this study to identify the occurrence of cochlear dysfunction after 4 weeks on MDR-TB patients using DPOAE *baseline* and pure tone audiometry.

Material and Method

This was an observational analytical longitudinal using pre and post test approach without controldesign and conducted at the in the MDR-TB outpatient clinic at Dr Soetomo Hospital Surabayafrom July 2018 until October 2018 which had been ethically legalized before. **Participants:** Subjects were 15 MDR TB patients that received 750 mg Kanamycin injection (i.m) every day for 4 weeks and the age of patients between 17 to 60 years old and not having symptoms that can be lead to hearing dysfunction (acute airway infection, allergic rhinitis, nasal polyps), working in noisy environments, pure tone audiometry results in conduction type or mixed type abnormalities, consuming ototoxic drugs and receiving streptomycin injections (Oral Anti Tuberculosis category 2).

Intervention: Subjects that were received Kanamycin injection after 4 weeks examination hearing DPOAE test with specific frequency (1000 Hz, 2000 Hz, 4000 Hz, 6000 Hz, 8000 Hz and 10000 Hz) using *Audx Pro* with overall criteria 4/6 *pass* and pure tone audiometry with specific frequency (250 Hz, 500 Hz, 1000 Hz, 2000 Hz, 4000 Hz, 6000 Hz and 8000 Hz). **Outcome:** DPOAE baseline and pure tone audiometry examination were performed to all subject which 15 ears were taken. This study was determined using the Mc Nemar test and Wilcoxon signed rank test with the level of significancy 5% (p=0.05).

Findings: This study selected 15 MDR-TB patients who received Kanamycin injection for 4 weeks after which audiometry and DPOAE examinations were performed to see hearing dysfunction due to Kanamycin injection in MDR-TB patients. In the DPOAE examination only 10,000Hz frequency can detect changes in the patient's hearing impairment but the Audiometry cannot.

Analysis data of DPOAE Test:

Table 1. The distribution and statistic analysis of DPOAE overall frequencies

DPOAE Result	Baseline	After Kanamycin Injection	p
Pass	15 (100%)	11 (73.3%)	0,12
Refer	0 (0%)	4 (26.67%)	
Total	**15 (100%)**	**15 (100%)**	

Based on the table 1, all of patients did not experience hearing impairment before Kanamycin injection treatment but after Kanamycin injection 4 weeks there were 4 patients who had hearing loss with using DPOAE. From the results of the MC Nemar test p = 0.12 which means there is no significant change in DPOAE as screening hearing in patients who experience hearing loss after Kanamycin injection for 4 weeks.

Table 2. The distribution and Statistical analysis of DPOAE each frequency.

Frequency (Hz)	Baseline			After kanamycin injection			P
	Pass	Refer	Total	Pass	Refer	Total	
1000	13 (86.6%)	2 (13.3%)	15	12 (80%)	3 (20%)	15	1.00
2000	14 (93.3%)	1 (6.6%)	15	14 (93.6%)	1 (6.6%)	15	1.00
4000	15 (100%)	0 (0%)	15	12 (80%)	3 (20%)	15	0.25
6000	12 (80%)	3 (20%)	15	9 (60%)	6 (40%)	15	0.37
8000	13 (86.6%)	2 (13.3%)	15	9 (60%)	6 (40%)	15	0.21
10000	14 (93.3%)	1 (6.6%)	15	5 (33.3%)	10 (66.6%)	15	0.002*

Based on the table above showsthat DPOAE with a frequency of 10,000Hz can identify hearing impairment in MDR-TB patients after Kanamycin injection for 4 weeks. Only 1 patient (6.6%) was previously detected as having problems *Refer*, but after therapy, DPOAE detected 10 patients (66.6%). The results of the McNemar test obtained p = 0.002 which means there is a change in the number of patients who experience hearing impairment after Kanamycin injection treatment using DPOAE.

Analysis data of Audiometry test:

Table 3. The distribution and statistic analysis of Audiometry each frequencies

Frequency (Hz)	Baseline			After kanamycin injection			p
	Normal	Hearing loss	Total	Normal	Hearing loss	Total	
250	15 (100%)	0 (0%)	15	15 (100%)	0 (0%)	15	1.00
500	15 (100%)	0 (0%)	15	15 (100%)	0 (0%)	15	1.00
1000	15 (100%)	0 (0%)	15	15 (100%)	0 (0%)	15	1.00
2000	15 (100%)	0 (0%)	15	15 (100%)	0 (0%)	15	1.00
4000	15 (100%)	0 (0%)	15	15 (100%)	0 (0%)	15	1.00
6000	15 (100%)	0 (0%)	15	14 (93.3%)	1 (6.3%)	15	0.317
8000	15 (100%)	0 (0%)	15	15 (100%)	0 (0%)	15	1.00

From table 3. it was found that all subjects baseline none of the patients were detected as having hearing impairment using audiometry at all frequencies. After Kanamycin injection for 4 weeks, only 6000Hz frequency can detect as many as 1 patient (6.3%) who have hearing impairment but from statistic result p=0,3017 that means there's no significant change in audiometry as hearing screening in patients with hearing impairment.

Table 4. The distribution mean Audiometry result each frequency

Frequency (Hz)	Baseline		After kanamycin injection	
	Mean	Total	Mean	Total
250	24.66	15	24.66	15
500	23.00	15	23.00	15
1000	23.00	15	23.00	15
2000	20.66	15	20.66	15
4000	25.00	15	25.00	15
6000	28.66	15	29.00	15
8000	23.33	15	23.33	15

From the table 4. an average Intensity of 28.6 dB can be heard with a frequency of 6000Hz from baseline using audiometry and after injection of Kanamycin 4 weeks, the average intensity is 29 dB. 26-40dB is categorized as mild deaf.

Discussion

The gender distribution of MDR TB patients who received kanamycin injections in this study hearing impairment occur more in male patient as many as 8 patient (53.3%) than female patient as many as 7 patient (46.6%). Gender can correlated with cochlear dysfunction or hearing impairment found by Kavalieratos (2012) and Rakhmawati (2015). Therefore it can be concluded that cochlear function disorders associated with hearing impairment in MDR TB patients is not influenced by gender.The WHO study in 2015 reports that the prevalence of pulmonary TB in male was 1.7 times than female. Manbeing more active and have contact with other frequently than woman. Many woman are often late and less interested in visiting health care centers than men, according to research conducted by Nakagawa.[8-10]

The age distribution of MDR TB patients who received kanamycin injections in this study was mostly in the age group 26 to 35 years as many as 5 patients, and age group 36-45 years as many as 5 patients. The results of this study in line with the research conducted by Magdalena, MDR TB patients age were less than 50 years with 65 people (80.2%). Productive age is quite dangerous to the media of transmission because they

have high mobility, easy to interact with other people, and allow to spread their disease to other people and the environment around the place of residence.[8,9]

Tinnitus was a symptommostly occurs in research subjects after injection of Kanamycin 4 weeks. DPOAE amplitude in patients with Tinnitus symptom showed a slight different. Cochlear function disorder that leads into tinnitus symptoms are characterized by a decrease in DPOAE amplitude at high frequencies above 4,000 Hz. Gouveris (2005) reported patients with tinnitus showed an increase in DPOAE amplitude at high frequencies of 4,000 Hz and 6,000 Hz and decreased amplitude at lower frequencies (1,650-2,400 Hz).[11]

The subjects of this study have the same dose injection in 15 MDR TB patients. They all received kanamycin injection of 750 mg. The duration and dose of kanamycin injection increased the risk of hearing impairment significantly. The dose and duration of therapy play an important role in hearing loss, as well as the cumulative total dose is associated with decreased hearing.[8, 12,13]

DPOAE is believed to be very useful in monitoring specific ototoxic effects on cochlear dysfunction and other effects especially on outer hair cells. DPOAE examination basically describes the motility activity of outer hair cells that show its function.[14] The examination results show that DPOAE detects as many patients who were previously detected as having disorders *Refer*only 1 patient after DPOAE therapy detected 10 patients who referred at 10,000Hz frequency.The results of the DPOAE on other study in 2016, from 52 MDR TB patients who received kanamycin injections for 4 weeks in the Kwazulu hospital, South Africa was found that 29 right ears and 30 left ears *pass* at baseline and 12 right ears and 14 left ears became *refer* after kanamycin injection.[15]

Examination using DPOAE with a frequency of 10,000Hz detected hearing impairment in MDR-TB patients after receiving a 4-week Kanamycin injection. The results of the statistical test found $p = 0.002$ ($p < 0.05$) which means that there are significant changes in patients who experience hearing loss after receiving therapybut was not significant at frequencies of 1000 Hz, 2000 Hz, 4000 Hz, 6000 Hz and 8000 Hz (table 3). Related with the result of this study was found the significant difference on DPOAE examination at frequency of 10,000Hz in high frequency as early detection. Hearing loss in those treated with aminoglycosides and polypeptides usually starts with high-frequency loss first[16]

From the Audiometry examination only 6000Hz frequency can detect as many as 1 patient (6.3%) who has hearing loss (table 6). The average Intensity that can be heard is 28.6 dBfrom baseline data and 29 dB after getting a 4-week Kanamycin injection. From the statistical results obtained $p = 0.317$ which means there are no significant specific changes in audiometry as hearing screening in patients with hearing imparment. However other frequency is not significant such as 250Hz, 500Hz, 1000Hz, 2000Hz, 4000Hz and 8000Hz.

The previous study reported that 14 people (42.4%) had normal hearing based on baseline audiometry. Meanwhile, audiometry on treatment found that only 3 people (9.1%) had normal hearing, most of them (90.9%) had hearing impairment. Mostly the hearing threshold shift at high frequencies, 6000 Hz and 8000 Hzand administration of kanamycin injection for 2 months or more was considered to have risk for ototoxicity.[17]The reason why audiometry is not maximally used as a screening for hearing loss is because the injection of Kanamycin for only 4 weeks has not given the ototoxic effect of kanamycin. The effect of cochlear toxicity usually occurs first at high frequencies which then extend towards a lower frequency depending on the length of exposure and dose given.[17] Another reason is that Audiometryc examination is only performed at the beginning of the baseline and after getting a 4-week Kanamycin injection. Audiological monitoring for ototoxicity recommends an audiometry evaluation one to two times a week[18]

Early exposure of ototoxic drugs can usually affect the basal cochlea. Further exposure causes the spread of damage towards the apex. Therefore, cochlear toxicity initially affects high frequencies and then extends to lower frequencies. Cochlear damage that occurs in outer hair cells leads to high frequency hearing loss and affects the otoacoustic emission process.[18, 19]

Conclusion

This study concludes that cochlear dysfunction occurs at a specific frequency of 10,000 Hz after 4 weeks Kanamycin injection, but not in overall frequency while in audiometry it cannot detect. Auditory evaluation at 4 weeks is considered not able to detect hearing impairment due to ototoxic drug MDR-TB. The useof ultra-high frequencies is recommended and may also use combination with OAE.

Conflict of Interest: There was no conflict of interest in this study.

Ethical Clearance: This study was received ethical approval from the Health Research Ethics Committee Dr. Soetomo Hospital Surabaya.

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Assessment of Coronary Heart Disease Risk among Diabetes Mellitus Survivor in Community Health Center Purwosari Indonesia

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Abstract

Diabetes mellitus if not appropriately managed will cause vascular complications such as coronary heart disease. The rate of coronary heart disease is very high, ranging from 45-70% presently. The symptoms of coronary heart disease in diabetes mellitus people can be seen clearly and also can not be seen until finally people suddenly die. According to the American Heart Association (AHA) approximately 65% of Diabetes Mellitus people die because of heart disease and stroke. The purpose of this study is to determine the description of coronary heart disease risk on diabetes mellitus people in Puskesmas Purwosari. This research is quantitative research. The population of this study was 480 Diabetes Mellitus survivor in Community Health Center Purwosari from January to August 2017. The Samples are 83 diabetes mellitus people who determined using accidental sampling technique. The data collection using an interview, medical record, and body mass index measurements then analyzed using descriptive analysis. The conclusion of this study is the characteristics diabetes mellitus people in Community Health Center Purwosari Surakarta were having a history of diabetes mellitus 1-10 years. The risk of coronary heart disease risk on Diabetes Mellitus survivors in Community Health Center Purwosari Surakarta was mostly high. Diabetes mellitus survivor should always improve the healthy lifestyle and routine to check their health up in health facilities.

Keywords: *Risk of coronary heart disease, diabetes mellitus, smoking, body mass index, complication.*

Introduction

Diabetes Mellitus is a metabolic disease characterized by hyperglycemia caused by interference with insulin secretion, reduced trauma to insulin deficiency, or both. They are for Type of Diabetes Mellitus (DM), namely type 1 Diabetes or absolute insulin deficiency, type 2 Diabetes or relative insulin deficiency, other specific Diabetes and Gestational Diabetes[1]. Type I Diabetes and Type 2 Diabetes are the two primary type of Diabetes[1-4]. The prevalence of Diabetes is high, making global burden. The incidence is rising due to the change of sociodemographic factor[4-6]. The number of Diabetes survivor in Indonesia was 10.02 million in 2015, with another 5.29 million undiagnosed[7]. Another data, Indonesia is the top 5th country, after India, China, the United States, and Pakistan with the amount most diabetics in the world, the number of the prevalence of people with diabetes in Indonesia is 9.1 million people.[8]

Poorly managed diabetes mellitus results in vascular complications make macrovascular complications such as coronary heart disease, peripheral vascular disease and stroke, and microvascular conditions such as retinopathy, nephropathy, and neuropathy[9]. Coronary heart disease is a complication that often occurs and tends not to be realized by people with diabetes mellitus.

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Coronary Heart Disease (CHD) is a heart disease caused by narrowing of the coronary arteries due to the process of atherosclerosis or spasm or a combination of both. The mechanism of coronary heart disease in diabetes mellitus is complicated and the risk of atherosclerosis has influenced by many factors including hypertension, hyperglycemia, total cholesterol levels, low-density lipoprotein (LDL) cholesterol, high-density lipoprotein cholesterol levels, triglyceride levels, smoking, lack of physical exercise, male sex, aging, family history, and obesity[10]. Coronary heart disease is the primary cause of death in Diabetes survivor[11].

The research aims to explore the results of coronary heart disease risk among Diabetes survivor.

Method

This research is a quantitative research with a descriptive approach. The study population was Diabetes survivor in Community Health Center Purwosari Surakarta from January to August 2017 as many as 480 people. The study sample was 83 patients, determined using accidental sampling technique. Research data collection used interviews, medical records, and body mass index measurements.

The method of collecting data was by interviews about the characteristic of respondents, smoking history, and physical exercise activities. We made history of blood pressure measurement in the last three months from medical records data of Diabetes survivor. Furthermore, body mass index score was calculated using the calculation of patients' height and weight for each Diabetes survivor. For the grouping of coronary heart disease risk, we used the Jakarta Cardiovascular Score questionnaire. Jakarta Cardiovascular Score (a modification of Framingham score) has tested from previous research. According to the results, the Jakarta cardiovascular score was simple and easy to use[12, 13]. The function of Jakarta Cardiovascular score as a tool for assessing risk for coronary heart disease among Diabetes survivor. Risk factors measurement in the Jakarta Cardiovascular Score in this study were age, gender, history of blood pressure, body mass index, smoking history, history of diabetes mellitus and physical activity.

Results

Characteristics of respondents, results from histpry taking assessment and body mass index calculation: As many as 83 Diabetes survivors were included in this study. Table 1 shows the personal, health history, and body mass index measurement of Diabetes survivor of these respondents. Most respondents were female (54.21%), live with diabetes for period 1-10 years (87.95%), an age of 50-64 (67.47%) and obese (68.68%). Furthermore, the results from history taking assessment revealed, most of the respondents were a non smoker (80.72%), have a history of Hypertension (59.05%) and have moderate activities (37.35%).

Table 1. Characteristic, health history and body mass index measurement of Diabetes survivor in Purwosari Health Center Surakarta

Characteristics	Frequency	Percentage (%)
Gender		
a. Female	45	54.21
b. Male	38	45.79
Age		
a. 25-49	27	32.53
b. 50-64	56	67.47
Duration of sick (Diabetes Mellitus)		
a. 1 – 10 years	73	87.95
b. 11-20 years	10	12.05
History of Hypertension		
a. Hypertension	49	59.05
b. No Hypertension	34	40.94
History of Smoking		
a. Non-Smoker	67	80.72
b. smoker	16	19.28
Body mass index category		
a. Obesity	57	68.68
b. Fat	15	18.07
c. Normal	11	13.25
Activity		
a. Heavy activity	30	36.15
b. Moderate activities	31	37.35
c. Light activity	15	18.07
d. Very light/Without activity	7	8.43

Risk of coronary heart disease: Based on the history taking assessment and body mass index measurement, we calculated the risk of coronary heart disease. Table 2 shows the categories for the risk of coronary heart disease, namely low risk, medium risk, and high risk using the results from Jakarta Cardiovascular Score. From table 2 we know that most Diabetes survivors have a high risk of coronary heart disease.

Table 2. Risk of Coronary Heart Disease among Diabetes survivor in Purwosari Health Center Surakarta

Risk of Coronary Heart Disease	Frequency	Percentage (%)
Low Risk	13	16
Medium Risk	28	34
High Risk	42	50
Total	83	100

Discussion

Characteristics of Respondents: Based on the results of the study showed that the majority of respondents were female. The number of Diabetic female survivors usually higher compared with men[14]. Research shows there are differences in the characteristics of diabetes in men and women[15, 16]. Also, most respondent experience Diabetes for less than ten years. A long duration of Diabetes also significantly associated with the quality of life of persons[17]. Besides, the high level of anxiety of illness can result in a decrease in the quality of life for persons with type II diabetes[18]. Meaningfully, the duration of suffering from DM also affects the beliefs of the person which influences the self- management. Sometime, persons suffered ≥ 11 years of DM have good self-efficacy than those who suffer from DM <10 years, and this is because the person has experience in managing his illness and has good coping.

The majority of Diabetes survivor in this study were nonsmoker (80.72%). Smoking gives contribution as the risk factor for coronary heart disease because it causes atherosclerosis[19], mechanisms of inflammation, and endothelial dysfunctions[20], Smoking also affect on sympathetic nerve activity, which in turn increases vascular tone, increases energy expenditure[21]. The nicotine content in cigarettes works like cocaine, makes the brain release the hormones dopamine, serotonin, and endorphins which affect a person's pleasant sensation. That's why many people are addicted and cannot escape this habit. Diabetes survivors may get worse if they continue smoking.

Overview of the risk of coronary heart disease: From this study, the majority of Diabetes survivor have a high risk of coronary heart disease, in line this study, the relative risk of myocardial infarction is 2 to 3 fold increased for people with diabetes compared to nondiabetics[10, 22]. The risk description of coronary heart disease shows that the highest distribution is high risk. Hyperglycemia causes an increased risk of coronary heart disease, glucose levels which increase especially over a long period of time causing accumulation of glycoproteins. Abnormal accumulation of glycoprotein located on the walls of the coronary blood vessels can destroy the structure and function of the arteries causing decreased blood flow to the heart muscle.

In general, all respondents are people with DM who have a risk of coronary heart disease. Some studies show that there is a relationship between DM and coronary heart events. Patients with type 2 DM had a higher risk of developing coronary heart disease than patients without type 2 DM.

Factors that helped increase the risk of CHD in this study were the age of the respondents. The age characteristics of the highest distribution respondents are 50 - 64 years. Aging is a natural thing as well as a factor that increases heart problems involving atherosclerosis and calcification[23].

Characteristic distribution of respondents age shows that the majority of respondents are groups of individuals with a high risk of having CHD, who suggested that the risk of CHD after 40 years is high[24].

Increased risk of coronary heart disease also occurs at the age of 45 years. Furthermore, the main factors at risk for coronary heart disease were hypertension, DM disease, behavior smoking, and family history[25].

Conclusion

The characteristics of most people with diabetes mellitus in the work area of Purwosari Public Health Center Surakarta have a long history of suffering from diabetes mellitus 1 - 10 years. The description of the risk of coronary heart disease in people with diabetes mellitus in the work area of Purwosari Health Center Surakarta is mostly high risk.

Suggestion: People with Diabetes Mellitus should improve their healthy lifestyle, including always controlling their health levels, for example controlling blood sugar levels and blood pressure, then doing activities that can reduce the risk of coronary heart disease such as exercising regularly.

Conflict of Interest: No declared.

Source of Funding: Self-funding from the research team.

Ethical Clearance: The ethical clearance of this research was accepted by School Nursing Universitas Muhammadiyah Surakarta

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Effectiveness of Providing Self-Management Education to Deal With Emesis Gravidarum on Decreasing Nausea Vomiting Pregnancy (NVP) at Private Practice Midwives Puskesmas IV Denpasar Selatan Work Area

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Abstract

Data shows that 50-90% of pregnant women experience nausea in the first trimester. Excessive gravida emesis will gain weight into hyperemesis gravidarum and can disrupt the mother's metabolism including dehydration, weight loss, alkalosis, and hypokalemia. Non-pharmacological therapy is a type of complementary therapy that can be used as an intervention to treat nausea including hypnotherapy, acupressure, acupuncture, relaxation, and therapy. Self-management is regulating personal activities to live a better and healthier life. Emesis gravidarum self-management education adopts the concept of Corbin and Straus in Kate and Halsted (2003), which is outlined in a module that aims to enable pregnant women to educate themselves to be able to regulate their own lives, set goals, and provide self-reinforcement in dealing with nausea, vomiting experienced. The purpose of this study was to determine the effectiveness of providing self-management education to deal with emesis gravidarum on decreasing Nausea Vomiting Pregnancy (NVP). This is an analytical study with a pre-experimental research design (quasi-experiment design) with one group pre-test-post test design. This study was conducted at Private Practice Midwives (hereafter: PMB) Puskesmas IV Denpasar Selatan Work Area. The population of this study was pregnant women who came to PMB in the work area of Puskesmas IV Denpasar Selatan. The sample of this study was pregnant women who experienced nausea and vomiting in the first trimester who met the inclusion criteria where the sampling technique in this study was accidental sampling. Analysis of the data in this study was conducted t-test to test the differences between the two pre and post-test distributions before self-management education was given and after the providing of self-management education was faced with emesis gravidarum. The results of the study showed that the average value of PUQE 24 hours before the self-management module was given was 9.5, the standard deviation value was 2.591, the minimum and maximum values were 6.0-14.0. The average value of PUQE-24 hours after the self-management module was given was 7.1, the standard deviation value was 2,273 with minimum and maximum values of 3.0-12.0. The conclusion of giving self-management module is effective to decrease nausea and vomiting in first-trimester pregnant women.

Keywords: *First-trimester pregnant women, emesis gravidarum, self-management education.*

Introduction

Pregnancy is the growth and development of the fetus in intra-uteri starting from conception and ending until the beginning of labor. The process of pregnancy causes changes in the body of the mother. These changes are largely due to the influence of hormones, for instance the hormones estrogen and progesterone. Increased hormones estrogen and progesterone in the body cause

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physiological discomfort in the mother such as nausea, vomiting, fatigue, and enlargement of the breast. The process of pregnancy causes various changes in the entire body system such as cardiovascular, respiratory and gastrointestinal systems influenced by the pregnancy hormone HCG (Chorionic Gonadotropin Hormone)[1].

Physiological adaptations to the gastrointestinal system cause discomfort in the form of nausea and vomiting. Pregnant women who have this will experience interference with their activities. Psychologically, nausea and vomiting during pregnancy affect more than 80% of pregnant women and have a significant effect on the quality of life[2].

Nausea and vomiting are one of the earliest, most common and most stressful symptoms in early pregnancy. About 50 - 90% of pregnant women experience nausea in the first trimester and about 25% of pregnant women experience nausea and vomiting problems. Nausea and vomiting most often occur in young pregnancies from the 6th week after the first day of the last menstruation. 50% of pregnant women who experience nausea and vomiting can overcome at the age of 14 weeks and 90% can overcome until the age of 22 weeks[3]. Nausea and vomiting during pregnancy, known as morning sickness, occurs in the first trimester of pregnancy and some continue until the second trimester. The frequency of occurrence of morning sickness is not only in the morning but can be daytime even at night[4].

According to the Lacase report of 367 pregnant women, 78.47% experienced nausea and vomiting that occurred in the first trimester; 52.2% experienced mild nausea and vomiting, 43.3% experienced moderate nausea and vomiting and 2.5% experience severe nausea and vomiting. In the second trimester, most pregnant women still experienced nausea and vomiting by 40% with the following details 63.3% experienced mild nausea and vomiting, 35.9% experienced moderate nausea and vomiting, 0.8% experienced severe nausea and vomiting.

Excessive emesis of gravidarum will become hyperemesis gravidarum which can disrupt the mother's metabolism, dehydration, weight loss, alkalosis, and hypokalemia. Impact on the fetus such as abortion, LBW, premature birth, and malformation in newborns[5].

Most pregnant women who experience nausea and vomiting in the community use pharmacological therapy. Some just left alone. The use of pharmacology for pregnant women needs to be considered because there are changes in pharmacokinetics and pharmacodynamics of drugs during pregnancy[6]. Non - pharmacological therapy, type of complementary therapy that can be used to treat nausea such as hypnotherapy, acupressure, acupuncture, relaxation, and therapy.

Nausea and vomiting during pregnancy are mild disorders; this condition can be overcome by self-control. In addition to self-control, nausea and vomiting can also be overcome by creating behaviors to reduce complaints[7]. Handling of nausea and vomiting in pregnant women needs to be done to improve maternal health status, one of them is by creating behaviors to reduce complaints. Creating behavior for a healthy life according to the patient's condition is part of self-management[8].

Emesis gravidarum self-management education adopts the concept of Corbin and Straus in the 7th, which is outlined in the form of a module that aims to enable pregnant women to educate themselves to be able to regulate their own lives, set goals and provide self-reinforcement in dealing with nausea and vomiting experienced

Material and Method

This study was held at PMB Puskesmas IV Denpasar Selatan's Work Area; six PMB in total. The design used in this study was a quasi-experimental with one group pretest-posttest design. The type of data collected is secondary data, obtained from the visitation register of pregnant women at PMB, Puskesmas profiles and primary data obtained directly from interviews with respondents about the characteristics, knowledge, and data on the level of nausea and vomiting. The instrument used was a questionnaire to determine the characteristics of respondents, and a questionnaire (PUQE-24 hours) to measure the severity of nausea and vomiting. The pregnant women as the respondents ware provided self-management modules and standard operating procedures to deal with emesis gravidarum. The population in this study was all pregnant women who had antenatal visits in PMB Puskesmas IV Denpasar Selatan work area in 2018. The sample of this study was pregnant women who experience nausea and vomiting who visited and met the study inclusion criteria. Criteria for inclusion; first-trimester pregnant women who experience nausea and vomiting are willing to be respondents and have not experienced complications in pregnancy. Exclusion

criteria are first-trimester pregnant women who experienced complications, hyperemesis gravidarum, and gastritis. The sampling technique used was accidental sampling, by taking respondents who happened to be present or at the time of the study. This was conducted for four months in BPM Region Puskesmas IV Denpasar Selatan. Severity measurement of nausea and vomiting on pregnant women with a questionnaire (PUQE-24 hours) was carried out twice; first, before being given self-management education (pretest) and second, two weeks after giving self-management education (posttest) modules. Data analysis used Paired T-test with a 95% confidence interval and a significance level of P <0.05.

Findings: The results of the analysis in this study are as follows:

Table 1: Frequency Distribution of Nausea and Vomiting before Providing the Self-Management Module at PMB Puskesmas IV Denpasar Selatan working area in 2019

No.	Nausea and vomiting	Frequency (f)	Percentage (%)
1	No symptoms	-	-
2.	Mild	10	25
3.	Moderate	22	55
4	Severe	8	20
	Total	**40**	**100**

Source: Primary Data Research in 2019

Based on table 1 shows that from 40 respondents before providing self-management module; 10 respondents (25%) showed mild symptoms, and 8 respondents (20%) showed severe symptoms, almost half of the respondents, 22 people (55%) showed moderate symptoms.

Table 2: Frequency Distribution of Nausea and Vomiting after Providing the Self-Management Module at PMB Puskesmas IV Denpasar Selatan work area in 2019

No.	Nausea and vomiting	Frequency (f)	Percentage (%)
1	No symptoms	3	7.5
2.	Mild	16	40
3.	Moderate	21	52.5
4	Severe	-	-
	Total	**40**	**100**

Source: Primary Data Research in 2019

Table 2 shows that from 40 respondents after providing self-management module; 3 respondents (7,5%) showed no symptoms of nausea and vomiting, almost half of respondent; 16 people (40%) showed mild symptoms, and more than half respondents; 21 people (52,5%) showed moderate symptoms, and no respondent showed severe symptoms.

Table 3: Pregnancy Unique Quantification of Emesis and Nausea (PUQE)-24 hours Score Before and After Providing Self-Management Module at PMB Puskesmas IV Denpasar Selatan Work Area in 2019

Variable	Mean	SD	Minimum	Maximum
Pretest	9,5	2,591	6,0	14,0
Posttest	7,1	2,273	3,0	12,0

Based on table 3 the mean of PUQE-24 hours before providing self-management module is 9.5, SD is 2,591, minimum and maximum are 6,0-14,0. Mean of PUQE-24 hour after providing self-management module is 7,1, SD is 2,273, minimum and maximum 3,0-12,0

Wilcoxon test was used due to not eligible data for parametric test:

Table 4: Wilcoxon Signed Ranks Test

Ranks				
		N	Mean Rank	Sum of Ranks
Post_ Modul-Pre_ Modul	Negative Ranks	31[a]	16.00	496.00
	Positive Ranks	0[b]	.00	.00
	Ties	9[c]		
	Total	40		

a. Post_Modul < Pre_Modul, b. Post_Modul > Pre_Modul, c. Post_Modul = Pre_Modul

Test Statistics	
	Post_Modul-Pre_Modul
Z	-4.886[b]
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test, b. Based on positive ranks.

Based on table 4 shows that *Asymp. Sig.(2-tailed)* with error rate 0.5%;p-value (0.000), (p < 0.05) So the Ho is declined and Ha is accepted. This means there is effectiveness in providing self-management module to decrease nausea and vomiting.

Discussion

The results of this study illustrate the tendency for a decrease in PUQE-24 scores from before and

after providing the module. The mean PUQE-24 score decreased by 2 points, 9.5 with a standard deviation of 2.591 before treatment, and 7.1 with a standard deviation of 2.273 after treatment. The results of statistical analysis with the Wilcoxon test showed the number of 31 respondents (76%) had decreased PUQE-24 scores with p-value =0,000. This proves that there is a significant effect on providing self-management modules on dealing with morning sickness. Kohen et al. (2005) categorize the severity of nausea and vomiting in pregnancy into 3 categories. The score of 0-3 has no symptoms, the score of 4-6 is mild, the score is 7-12 moderate, and the score is ≥ 13 severe categories.

Based on the characteristics of the frequency of morning sickness, before treatment there were 25% of respondents experiencing mild nausea and vomiting, 55% experienced moderate nausea and vomiting, and 20% of respondents who experienced severe nausea and vomiting. After treatment, respondents who did not experience nausea and vomiting (7.5%), those who experienced mild nausea and vomiting became 40%, and those who experienced moderate vomiting nausea 52.5%. Wilcoxon statistical test results showed a significant difference between PUQE scores before giving morning sickness self-management modules and after administration. This shows that there is an effect of morning sickness self-management module on the decrease in the frequency of nausea and vomiting in pregnant women. Value p = 0,000 so that it can be concluded that this self-management module is effective in dealing with morning sickness in pregnant women.

The use of morning sickness self-management module to decrease the frequency of nausea and vomiting in pregnant women was only investigated by Latifah L (2014) where the results of the study showed that differences in the pretest and posttest values were analyzed using the Wilcoxon test, so that a significance value : 0,000 (p <0.05) was obtained[9]. There is a difference in the PUQE score before and after giving the morning sickness self-management module. The morning sickness self-management module is effective in dealing with morning sickness in pregnant women. The previous study did not measure respondents' prior knowledge and used a minimum of 30 respondents.

The self-management module has been applied to several independent treatments for cardiovascular disease and schizophrenia. Self-management treatment method have been investigated for their effects on chronic diseases such as cardiovascular disease, diabetes mellitus, chronic obstructive pulmonary disease, and schizophrenia. Diabetic patients who follow the self-management program are shown to have significantly improved their clinical conditions (decreased blood sugar), can achieve self-care targets, and are satisfied with health care[9]. Research on the chronic obstructive pulmonary disease (PPOM) has also shown equally positive results. Patients who participated in the self management program experienced a decrease in the severity of the disease by 39.8%, a decrease in the number of hospital visits by 57.1%, a decrease in the number of visits to the doctor incidentally by 58.9%, and a decrease in visits to the emergency department by 41%[10].

Self-management is one of the most common terms used in health promotion and patient health education. Self-management is very useful for patients, especially patients with chronic diseases where only patients who can be responsible for the treatment of the disease daily during his illness. Patients with chronic diseases besides experiencing physical disorders, usually also experience psychological disorders and well-being. Therefore, self-management programs often focus on improving self-perspective and patient welfare[7].

Morning sickness self-management module contains several interventions to overcome nausea and vomiting during pregnancy, including the consumption of ginger drinks, food management, gradual mobilization during the morning, acupressure, and relaxation. Several studies have proven that ginger products which can be in the form of drinks or extracts are proven to overcome nausea and vomiting during pregnancy[12]. McKinney et al. (2009) mentioned that eating arrangements by eating small but frequent portions, avoiding oily foods, consuming more protein compared to carbohydrates, and separating eating and drinking can reduce the incidence of nausea and vomiting during pregnancy[11]. Wentorf and Dykes (2001) and Artika (2006), found that acupressure by suppressing the P6 point (Neiguan point) was significant in reducing nausea and vomiting during pregnancy[13]. During the study, there were no respondents who complained about the difficulty in implementing the tasks and recommendations in the morning sickness self-management module.

Conclusion

Providing Self-Management Education to Deal

Emesis Gravidarum Effective on Decreasing Nausea Vomiting Pregnancy (NVP) at PMB Puskesmas IV Denpasar Selatan Work Area.

Conflict of Interest: None

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Ethical Clearance: Have got the letter of ethical eligibility from the research ethics committee of the Faculty of Medicine of Udayana University/ Sanglah Hospital Denpasar with a letter number:1193/ UN14.2.2.VII.14/LP/2019.

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The Effectiveness of Progressive Muscle Relaxation with Benson Relaxation on the Sleep Quality in Hemodialysis Patients

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Abstract

Objects: to identify effectiveness of progressive muscle with benson relaxations on the sleep quality in hemodialysis patients.

Method: the study used a quasi-experimental with comparison of pre and post-tests without control groups. The samples were selected by consecutive sampling technique based on criteria inclusion. The sample size was 48 patients. Sleep quality was measured by applying Pittsburgh Sleep Quality Index. Data analysis used Wilcoxon signed rank and Mann-Whitney U test.

Results: The result showed that there was effect of muscle relaxation with benson relaxation on the sleep quality in hemodialysis patients with p-value 0.00 ($p<0.005$).

Conclusion: The intervention of progressive muscle relaxation and benson relaxation have same effectiveness to improve the sleep quality of the hemodialysis patients with sleep disorders so that nurse should apply this intervention to improve the sleep quality patients with hemodialysis.

Keywords: *Progressive Muscle Relaxation, Benson Relaxation, Sleep Quality, Hemodialysis.*

Introduction

Hemodialysis is one of the method of treatment of end-stage kidney failure that is considered to be able to save lives [(1)]. This therapy is also a stressor for patients because it requires some lifestyle restrictions and modifications that negatively impact physical and psychological well-being[(2)]. Hemodialysis patients are considered to be very vulnerable to psychological problems due to chronic stress associated with client dependence on hemodialysis machines, duration of dialysis therapy, restrictions on physical activity, changes in body image, sexual dysfunction, as well as fluid and food restrictions[(3)].

Mollahadi, Tayyebi and Daneshmandi[(4)] said psychological problems that often occur in hemodialysis patients, namely anxiety, depression, and stress. This study is in line with research conducted by Wang and Che[(5)] stated that hemodialysis is a therapy that can affect a patient's psychological status. Psychological problems are a major factor contributing to sleep disorders in patients undergoing hemodialysis [(6)].

Sleep disturbance is the most frequently reported complication among hemodialysis patients with a prevalence of 80% [(7)]. Sleep disturbance is an abnormality in the normal sleep-wake cycle, causing distorted and fragmented sleep patterns [(8)].

Sleep disorders during long periods refer to poor sleep quality can result in physical and psychological

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complications in patients undergoing hemodialysis[9]. Physical complications related to sleep disorders such as daytime drowsiness, lack of energy, psychomotor dysfunction, and can lead to decreased patient appearance such as cognitive and memory dysfunction [10]. Sleep disorders can also result in impaired immune function, obesity, diabetes, hypertension, stroke and heart disease[11].

Non-pharmacological management that can be used to improve the sleep quality of hemodialysis patients is progressive muscle relaxation and benson relaxation. Progressive muscle relaxation is a therapy that aims to provide emotional balance and peace of mind by focusing on muscle activity by identifying tense muscles and then reducing tension by using relaxation techniques to achieve a relaxation response (relax) [12].

The study by Rambod, Pourali-Mohammadi, Pasyar, Rafii and Sharifstated that Benson's relaxation has a significant effect on daytime sleep disorders in hemodialysis patients [13]. Supporting related study by Masry, Aldoushy and Abd showed that Benson's relaxation techniques have a positive effect in reducing postoperative pain and improving sleep quality among adults and elderly patients undergoing joint replacement surgery[14].

Based on the description above, researchers are interested in conducting research on "The Effectiveness of Progressive Muscle Relaxation with Benson Relaxation on the Sleep Quality of Hemodialysis Patients in H. Adam Malik General Hospital Medan".

Method

This research was a quasi-experimental research with a comparative approach. This research was carried out in the hemodialysis unit in July-September 2018. Sampling using consecutive sampling. The sample size in this study was determined using the Power Analysis table with power (1-β)=.90, effect size (γ)=.73 and α=.05. Anticipating the possibility of selected subjects or samples dropping out, it is necessary to increase the number of samples by 10% so that the sample size remains fulfilled so that the sample in each intervention becomes 48 people.

This research used The Pittsburgh Sleep Quality Index (PSQI) instrument. PSQI is the gold standard for the assessment of subjective sleep quality[15]. PSQI is a questionnaire that assesses sleep quality during a month interval. This instrument is to identify "good" and "bad" sleep quality by measuring sleep based on 7 sleep components including sleep duration, sleep disturbance, sleep latency, sleep dysfunction during the day, sleep efficiency, sleep quality, and use of sleeping pills. The score on the subjective sleep quality assessment is divided into 4 criteria: very good, good, bad, and very bad. The assessment is done by giving a score of 0-3 with a range of scores of 0 for very good and a score of 3 for very bad. Then the total score for the seventh. This component produces a global score which has a range of scores from 0 to 21. The overall PSQI score which shows ≤5 means that the respondent has good sleep quality and if it shows a number> 5 means poor sleep quality [16].

The bivariate analysis used in this study was the Wilcoxon signed ranks test. This test was to see differences in sleep quality before and after relaxation interventions in each intervention group, while the Mann-Withney U test is used to see differences in sleep quality between progressive muscle relaxation groups and Benson relaxation.

Results

Table 1: Frequency distribution of demographic characteristics of hemodialysis patients

Variable	Progressive Muscle Relaxation (n=48)		Benson Relaxation (n=48)	
	f	%	F	%
Age				
18-34 years	18	37.50	14	29.20
35-54 years	23	47.90	32	66.70
≥55 years	7	14.60	2	4.20
Gender				
Male	37	77.10	31	64.60
Female	11	22.90	17	35.40

Variable	Progressive Muscle Relaxation (n=48)		Benson Relaxation (n=48)	
	f	%	F	%
Long of Hemodialysis				
< 1 year	20	41.70	18	37.50
1-2 years	18	37.50	19	39.60
> 2 years	10	20.80	11	22.90
Hemodialysis Session				
Morning	32	66.70	30	62.50
Afternoon	16	33.30	18	37.50

Based on table 1, respondents in both intervention groups were more male, age 35-54 years old, long of hemodialysis is in the range <1 year to 1-2 years and morning hemodialysis session schedule.

Table 2: Mean rank difference in sleep quality of hemodialysis patients before and after progressive muscle relaxation and benson relaxation (n = 48)

Variable	Mean rank		Z	p-value
	Pre-test	Post-test		
Progressive Muscle Relaxation Group				
Sleep quality	21.00	,00	-5.59	,00
Benson Relaxation Group				
Sleep quality	22.50	,00	-5.78	,00

Based on table 2, the results of data processing using the Wilcoxon Signed Rank Test showed that there were differences in the sleep quality of hemodialysis patients before and after the intervention of progressive muscle relaxation and benson relaxation as measured by PSQI.

Table 3: differences in the quality of sleep of hemodialysis patients after the intervention between progressive muscle relaxation and benson relaxation groups (n = 48)

Variable	Median (minimum-maximum)	z	p-value
Progressive muscle relaxation group			
Sleep quality	4.00 (3-14)	-1.85	.06
Benson relaxation			
Sleep quality	4.00 (2-14)		

Based on table 3 the results of statistical tests using the Mann-Whitney U Test, obtained p=0.06 (p> 0.05), showed that there was no difference in the quality of sleep of hemodialysis patients after the intervention of progressive muscle relaxation and benson relaxation as measured by PSQI.

Discussions

The results of this study indicate that there was a significant difference between sleep quality before and after progressive muscle relaxation interventions (p=0.00). According to Seyedi Chegeni, Gholami, Azargoon, Hossein, Birjandi and Norollahi progressive muscle relaxation can improve sleep quality in hemodialysis patients, where by contracting and relaxing muscles it can reduce the input and output of motor neurons, i.e. pre-synapse it will reduce proprioceptive reflex control and post-synapse will reduce the control of the ecstrospective reflexes[17]. Proprioceptive and ecsteroseptive reduction will result in decreased motor evoked potential (MEP) which will further reduce the activity of the skeletal-motor system, autonomic nervous system (sympathetic and parasympathetic) and cortical pathways[18].

Activation of the parasympathetic nervous system, also called trophotropic, will manipulate the

hypothalamus by causing a feeling of relaxation and being more physiologically and emotionally comfortable, and can cause feelings of wanting to rest, and physical repair of the body, whereas a decrease in the cortical and hypothalamus can cause a relaxed sensation and calm psychological[19].This relaxed feeling will be transmitted to the hypothalamus so that the hypothalamus produces Corticotropin Releasing Factor (CRF). CRF will stimulate the pituitary gland so that the production of several hormones will increase, such as β-endorphin, encephaline and serotonin. Physiologically, the need for sleep will be fulfilled because of the decreased activity of the Reticular Activating System (RAS) and noreepineprine as a result of decreased activity of the brain stem system. The relaxation response will occur because of the activity of the nuclear nucleus parasympathetic autonomic nervous system [20].

The results of this study indicate that there was a significant difference between sleep quality before and after the benson relaxation intervention (p=0.00). Improving sleep quality can be done by using Benson relaxation. This technique is a combination of deep breath relaxation by involving the beliefs held, where by saying a word or sentence can be the name of God or a series of prayers repeatedly according to each religious beliefs accompanied by an attitude of resignation can produce an optimal relaxation response that is the condition of relaxation is not only physical but also mind. This relaxation response is needed to enter the alpha wave, which is a condition that someone needs to enter the initial sleep phase. The basis of this theory is that in the human nervous system there is a central and autonomic nervous system[13]. The function of the central nervous system is to control the desired movements, while the autonomic nervous system has two opposing functions, namely the sympathetic nerve function which stimulates the work of organs and the parasympathetic nervous system which dampens the work of organs. When humans are in tension or stress, the sympathetic nerves are stimulated so that the workings of the body's organs will increase, whereas when humans do benson relaxation will produce a relaxation response, where the resulting relaxation response will cut off the activation pathway of the sympathetic nervous system and replace it by activating the parasympathetic nerve response resulting in a decrease in the workings of body organs. This condition will accelerate someone entering the alpha wave which is a condition needed by someone to enter the early sleep phase [21].Physiologically when humans enter the relaxation phase, then they enter the alpha wave (7-14 Hz). When the brain enters this wave, the brain will produce endorphin hormones which produce a sense of comfort and calm [22].

Mann-Whitney test results, obtained p=0.06 (p>0.05), so it can be concluded that there is no difference in sleep quality between the progressive muscle relaxation and Benson relaxation groups. This can be understood because based on the theory of both progressive muscle relaxation and benson relaxation can produce trophotropic relaxation responses, where the resulting relaxation response will cut off the activation pathway of the sympathetic nervous system and replace it by activating the parasympathetic nerve response. Activation of the parasympathetic nervous system will manipulate the hypothalamus by causing feelings of wanting to rest and physical repair of the body[19].

Conclusion

Based on the results of this study, it can be concluded that progressive muscle relaxation exercises and Benson relaxation performed twice a day for 4 weeks have the same effectiveness in improving the sleep quality of hemodialysis patients. Progressive muscle relaxation and Benson relaxation can be complementary therapies in hemodialysis patients who experience sleep disturbance problems.

Conflict of Interest: Nil

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Characteristics of Patients with Diabetic Foot Ulcers and Predictors of Surgical Intervention in Basrah, Southern Iraq

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Abstract

Background: Diabetes mellitus is a diseases of worldwide importance, the incidence and complications of this disease became an increasing problem. In Basrah,southern Iraq, the prevalence of DM is very high . Diabetic foot is a source of significant morbidity and change in quality of life for diabetic patients.

Objectives: To describe the characteristics of sample of patients with diabetic foot ulcer who attended Al Fayha Diabetic Foot Clinic and to evaluate the predictors of surgical intervention needed for treatment of these patients especially for those who are in need for amputation.

Method: A cross sectional descriptive study conducted in Al Fayha Diabetic Foot Clinic, Basrah, Iraq. From January 2018 until July 2019. It included 73 adult patients suffering from diabetic foot ulceration : 29 (39.7%) male patients and 44 (60.3%) female patients.

Results: The mean age was 52.86 years. The study included 71 patients with type 2 diabetes (97.3%) and 2 patients with type 1 diabetes (2.7%).The mean duration of symptoms was approximately one month. More than half of the cases who underwent debridement had wounds of grade 2 (University of Texas Classification) while 88% of cases who underwent amputation had wounds of grade 3. In the group of patients who underwent debridement, 41 cases (85.4%) had moderate infection (IDSA), while for those who underwent amputation, 16 cases (64%) had severe infection and this difference was statistically significant (p value <0.001).

Conclusions: The majority of patients were females (60%),the age group of 50 years and above constitutes more than half of the cases,almost 80% have the disease for more than 10 years,all cases showed evidence of uncontrolled disease. Wound stage (UT Classification) and IDSA severity of wound infection were the predictors for surgical intervention in patients suffering from diabetic foot ulcers in Basrah.

Keywords: *Diabetic foot ulcers, predictors, Basrah, surgical intervention.*

Introduction

Diabetes mellitus (DM) affects around 451 million people worldwide.(1) It continued to be a rising global problem. The incidence of DM is rising and consequently the complications of this disease became an increasing problem. Unfortunately complications end with morbidity and premature death in high proportion of cases. In Basrah, Iraq, the prevalence of DM is very high, about 20% of adult population are affected.(2)

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Diabetic foot ulcers (DFUs) are a quite significant sequel affecting around 25% of diabetic patients[3].

DFUs are defined as non-healing or poorly healing full-thickness wound through the dermis below the ankle in individuals with diabetes for more than three months. DFUs are three types: neuropathic, ischaemic and neuro-ischaemic ulcers.[4]

Peripheral neuropathy, ulceration, infection and peripheral vascular disease are the most important causes for ulcer complication and lower limb amputation in diabetic patients.[5,6]

Diabetic foot must be managed by multidisciplinary team.[7] Proper management of diabetic foot infection should be preceded by proper clinical diagnosis, assessment of severity of infection and wound classification, control of blood sugar, debridement, obtaining adequate specimen for culture, adequate selection of antibiotics, proper timing and selection of surgical intervention with adequate wound care.[8]

Surgical debridement is cutting away of all necrotic tissue, infected material from the wound and a surrounding callus until a healthy bleeding edge is reached . The benefit of surgical debridement is the change of infected ulcer into an acute ulcer .[9,10]

Minor amputation, is amputation at the level of the foot without the need for prosthesis for walking while major amputation is amputation above the level of the ankle.[11,12]

Aims of the Study:

1. To describe the characteristics of sample of patients with diabetic foot ulcer who attended Al Fayha Diabetic Foot Clinic.
2. To evaluate the predictors of surgical intervention needed for treatment of these patients especially for those who are in need for amputation, this can aid in planning of treatment.

Patients and Method

Study Design: This is a cross sectional descriptive study conducted in Al Fayha Diabetic Foot Clinic, Basrah, Iraq. From January 2018 until July 2019. It included 73 adult patients suffering from diabetic foot ulceration:29 (39.7%) were male patients and 44 (60.3%) were female patients .A questionnaire form is completed.It included patients name, age, sex, duration of diabetes, duration of symptoms,previous use of antibiotics. Patients were assessed in three levels : the patient as a whole,the involved limb and local examination of the wound.

Local Examination of the Wound:

1. Diabetic foot wound classification according to University of Texas Classification (four grades and four stages).[13]
2. Evaluation of foot vascularity clinically and by the use of hand hold Doppler.
3. Infected diabetic foot ulcers were diagnosed clinically by presence of features of inflammation, infection severity was evaluated according to Infectious Diseases Society of America (IDSA). [14] Surgeons should keep in mind that systemic signs of inflammation (fever and leukocytosis) are not present even with advanced foot infection.[15,16]

Investigations: All patients had been sent for the following investigations :hemoglobin, random blood sugar, Hb A1c, white blood cells count, renal function test and viral markers of hepatitis B, hepatitis C and HIV. HbA1c $\geq$ 9 is considered as an indicator of poor glycemic control.[17]

Management: The patients admitted to the surgical ward of Al Fayha Hospital. Empirical antibiotics started with control of blood sugar . Surgical debridement has been done in the operating theatre and specimen from the wound has been sent to the laboratory for culture and sensitivity .This was followed by wound care. All patients were followed twice weekly for twelve weeks,then monthly for six months.

Exclusion Criteria: Patients who did not come for regular follow up were excluded.

Statistical Analysis: The results were analyzed by the use of Statistical Package for the Social Sciences (SPSS) version 23 . P-value $\leq$ 0.05 was the statistically significant level.chi-squared test and Fissures exact test were used whenever needed.

Results

Demographics of the Studied Patients: Most of the patients were females 44(60.3%) and tended to increase in proportion with advancing age in both sexes. The percentage in males increased from 13.8 to 37.9% and from 2.3 to 29.5% in females. The bulk of patients in females was in the age group 40-49 (40.9%).

The mean age was 52.86 years (standard deviation 9.059) The study included 71 patients with type 2 diabetes (97.3%) and 2 patients with type 1 diabetes (2.7%) (Table 1).

Table 1: Age and sex distribution of the studied patients

Age (Years)	Male No.%	Female No.%	Total No.%
<40	4 13.8	1 2.3	5 6.8
40-49	5 17.2	18 40.9	23 31.5
50-59	9 31.0	12 27.3	21 28.8
60 & above	11 37.9	13 29.5	24 32.9
Total	29 100.0	44 100.0	73 100.0
Sex composition	29 39.7	44 60.3	73 100.0

Characteristics of diabetes: Table 2 shows a number of characteristics of diabetes patients enrolled in the present study. The chronic status is very clearly indicated by the long duration of the disease. Almost 80% have the disease for more than 10 years. In addition cases showed very unsatisfactory control indicated by the high level of random blood sugar (Almost 94.5% have a level 200 mg/dl or more) and the high values of HbA1C (All cases showed evidence of uncontrolled disease).With respect of diabetic foot, it seems that it is a fairly recent pathology as the duration of symptoms and antibiotic use were both recent events. More than half of the patients delayed asking for doctor advice for 30 days or more.

Table 2: Some characteristics related to diabetes

Characteristic	Number	%
A. Duration of diabetes (Years)		
<10	16	21.9
10-19	45	61.6
20-30	12	16.4
B. Status of Hb A1C at the time of study		
Controlled (3.0-6.9)	0	0.0
Uncontrolled (7.0-8.9)	19	26.0
Very poor control (≥9)	54	74.0
C. Random blood sugar (Mg/dl)		
100-199	4	5.5
200-299	23	31.5
300-399	37	50.7
(≥400	9	12.3
D. Duration of symptoms before consultation (Days)		
<10	4	5.5
10-19	23	31.5
20-29	6	8.2
≥ 30	40	54.8
E. Duration of use of antibiotics before consultation (Days)		
None	20	27.4
<10	3	4.1
10-19	34	46.6
≥20	16	21.9
Total	**73**	**100.0**

Predictors of surgical management: Three types of surgical management were done to patients; debridement, minor amputation and major amputation. We attempted to use selected demographic and clinical characteristics to predict which patient needed debridement only and which patient needed amputation.

The mean age of both groups was comparable. Most patients who underwent debridement were females (30 cases), while there was no sex difference for those cases who underwent amputation. The mean duration of diabetes for both groups was approximately 12 years.

The mean duration of symptoms was approximately one month in both groups. Regarding wound grade (UT Classification), more than half of the cases who underwent debridement had wounds of grade 2 while 88% of cases who underwent amputation had wounds of grade 3.

In the group of patients who underwent debridement, 41 cases (85.4%) had moderate infection (IDSA), while for those who underwent amputation, 16 cases (64%) had severe infection and this difference was statistically significant (p value <0.001) (Tables 3).

Table 3: Univariate analysis: Association of type of management and selected variables

Characteristics	Patients undergone debridement only No.%	Patients underwent amputation No.%	Total No.%	P value
Age (Years)	53.2	52.3		0.184
Sex				
Male	18 (37.5%)	11 (44%)	29 (39.7%)	0.385
Female	30 (62.5%)	14 (56%)	44 (60.3%)	
Mean Duration of diabetes (Years)	12.8	12.2		0.92
Mean Duration of symptoms (Days)	35.3	34.2		0.22
Wound Grade (UT Classification)*				
Grade 2	27 (56.3%)	3 (12%)	30 (41.1%)	<0.001
Grade 3	21 (43.8%)	22 (88%)	43 (58.9%)	
Wound Stage (UT Classification)*				
B	48 (100%)	21 (84%)	69 (94.5%)	0.01
D	0 (0%)	4 (16%)	4 (5.5%)	
IDSA				
Mild	2 (4.2%)	0 (0%)	2 (2.7%)	<0.001
Moderate	41 (85.4%)	9 (36%)	50 (68.5%)	
Severe	5 (10.4%)	16 (64%)	21 (28.8%)	
Total	48 (65.8%)	25 (34.2%)	73 (100%)	

*University of Texas Classification

Multivariate analysis: Logistic regression:

Predictors of Amputation: To predict independent and significant predictors of surgical intervention (amputation), a logistic regression analyses were done and the results are shown in Tables 4 and 5. Three variables (wound stage, wound grade and random blood sugar) were independently significant predictors of surgical intervention in patients with diabetic foot .All other variables (age, sex, HbA1c, duration of diabetes, presence of ulcer, etc…) could not predict this outcome.

Table 4: Predictors of Amputation

Variable	B	t	P value	Confidence Interval	
				Lower	Upper
Wound Stage	0.49	3.834	0.000	o.235	0.744
Wound Grade	0.403	3.411	0.001	0.167	0.639
Random Blood Sugar	0.002	2.174	0.033	0.000	0.003

However, when we introduced IDSA in addition to other variables, only IDSA and stage of the wound were significant predictors (table 5). All other variables (random blood sugar and wound grade) either lost their prediction or they were not predictors from the start.

Table 5: Predictors of Amputation

Variable	B	t	P value	Confidence Interval	
				Lower	Upper
IDSA	0.597	5.455	0.000	0.379	0.815
Wound Stage	0.429	3.588	0.001	0.190	0.667

Discussion

The prevalence of diabetes in Iraq is increasing.[18] Diabetic foot is a source of significant morbidity and change in quality of life for diabetic patients,their limbs carries 15-40% higher risk of amputation in comparison to non-diabetic patients.[19] Furthermore, major amputation leads to limited daily activity of the patient.[20]

In the study of Zameer Aziz et at which was done in Singapore in 2005 on 100 patients with diabetic foot infection, the mean age of the patients was 59.8 years with male: female ratio 1:1,they concluded that risk factors for lower limb loss were: gangrene of the foot, ankle brachial index ≤0.8,WBC ≥ 15x 10^{9}/L and hemoglobin ≤ 10.0 g/dl.[21]

In a study done in Brazil by dos Santos et al from March 1999- November 2001, included 99 patients with diabetic foot infection. Most of the patients were males (69.7%), the mean age was 60.2 years, they found that risk factors for major amputation were: age, ascending lymphangitis, calcaneal lesions, Wagner grade 5 lesions, arterial insufficiency, diabetes duration and Gram positive microorganisms in culture.[22]

In a study done by Miyajima et al in Japan between July 1997 – August 2003,they studied 210 patients with diabetic foot lesions, amputation was performed in 52% of cases, the mean age was 64.2 years, they found three independent risk factors for major amputation :multiple arterial stenosis, hemodialysis and HbA1c. While Pemayun et al in a study conducted in Indonesia between January 2012 to December 2014, they concluded in addition to peripheral arterial disease and HbA1c, hypertriglyceridemia and hypertension are predictors of lower extremity amputation.[23]

In the present study, some different findings are identified, younger age, higher proportion of female patients and the predictors of amputations were also somewhat different. The differences could be due to methodological issues, mix of patients and level of control of diabetes mellitus.

Conclusions

1. Characteristics of the studied patients with diabetic foot ulcers were as follows:
   A. The majority of patients were females (60%).
   B. The age group of 50 years and above constitutes more than half of the cases.
   C. Almost 80% have the disease for more than 10 years.
   D. All cases showed evidence of uncontrolled disease.
2. Wound stage (UT Classification) and IDSA severity of wound infection are the predictors for surgical intervention in patients suffering from diabetic foot ulcers in Basrah.

Statement of ethics: Verbal and written informed consent obtained from all patients included in this study. Ethical approval obtained from research ethics committee of Basrah Directory of Health.

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Low CD4 Level Increased the Risk of Cognitive Impairment in the HIV Patient

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Abstract

Background: HIV infection leads to neurological damage that results in cognitive and behavioural impairment called HIV-associated neurocognitive disorder (HAND). There are several factors associated with HAND which include the CD4 count. Patients who present with the CD4 level lower than 200 cells/mm^3 are considered very vulnerable of experiencing neurological complications such as HAND.

Objective: To investigate the association between CD4 level and cognitive impairment evaluated using MoCA-INA among HIV patients.

Materials and Method: This cross-sectional study involves 72 consecutive patients with HIV (Human Immunodeficiency Virus) infection from the Infecion Ward of Soetomo General Hospital Indonesia. All participating patients was measured its cognitive impairment through MoCA-INA score. Blood samples were collected for CD4 evaluation. Statistics were evaluated with SPSS 25.0.

Results: The research participant consisted of 43 (59.7%) male and 29 (40.3%) female with mean age of 38.22 ± 9.159, CD4 level of 447.4 ± 247.48 and MoCA-INA score of 26.36 ± 2.770. Chi-Square analysis showed a significant difference (p-value of 0.023) in the cognitive function in the HIV patient with low CD4 (CD4<200cell/mm^3) compared tonormal CD4 (CD4≥200 cell/mm^3) with Odd Ratio of 4.900 (95% CI, 1.278–18.793).

Conclusions: Low CD4 level increase the risk of cognitive impairment assessed using MoCA-INA scoring system. These suggested that HIV patient with low CD4 should have initial screening of cognitive impairment.

Keywords: *Cognitive, Immunodeficiency, Mental Health, MoCA-INA.*

Introduction

UNAIDS (*Joint United Nations Programme on HIV/AIDS*) reported that the incidence of HIV infections across the globe reached 36.7 cases at the end of 2015. It has also been reported that there are approximately 5 million HIV cases around Asia.[1] Department of Health of the Republic of Indonesia reported the cumulative number of HIV and *Acquired Immunodeficiency Syndrome* (AIDS) cases from all 34 provinces and 407 districts/cities across the nation since the first time it was discovered in 1987 up to March 2016 were 198,219 and 78,292 cases, respectively.[2]

HIV could lead to neurological damage that results in cognitive and behavioral impairment called AIDS Dementia Complex (ADC) or HIV-associated neurocognitive disorder (HAND).[3] HAND is one of the most important HIV-related complications in this era of antiretroviral (ARV) therapy. ARV combination therapy

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using highly active antiretroviral therapy (HAART) is found to substantially improve the neurocognitive function and is attributed to a significant decline in the incidence of HAND. The prevalence of neurocognitive disorders, however, is still beyond the expected number that reaches over 50%. This is attributed to the fact that in this era of HAART, there has been a shift on HAND's clinical presentation towards milder disease that results in delayed diagnosis should the formal neurocognitive and neuropsychological assessment not performed due to subtle manifestation. The prevalence, incidence and severity of HAND is increased along with the increased population of HIV patients.[4] Several factors are thought to correlate with the occurrence of HAND and one of which is the CD4 counts. The patients who present with the CD4 level lower than 200 cells/mm^3 are at a substantial risk of developing neurological complications.[4] The low CD4 level can lead to decreased systemic immunity and increased proliferation of HIV within the central nervous system (CNS).[6] Furthermore, a series of processes will take place and lead to neural cell death and eventually the cognitive impairment/HAND; however, the studies investigating the association between CD4 counts and HAND are still limited.

MoCA has been widely used in the assessment of cognitive function. We chose MoCA as the instrument for cognitive assessment in this study given the contents of the questionnaire that cover various cognitive domains, including executive function, visuospatial function, attention and concentration, memory, language, calculation and orientation.[7] Indonesian version of MoCA, also called MoCA-INA, has been developed and validated in Indonesia and thus can be used as an instrument for cognitive assessment in our population.

The objective of this study was to investigate the association between CD4 counts and the occurrence of cognitive impairment assessed using MoCA-INA scoring system among HIV patients.

Materials and Method

Research Design: This retrospective study consisted of patients with HIV infection from the Infection ward of Dr. Soetomo General Hospital, Surabaya. Eligible patients required to be ≥ 18 years old and diagnosed with HIV infection. Patient with depression, structural brain lession or illiterate are excluded.

Cognitive Impairment Measurement: Cognitive ability was measured by using Montreal Cognitive Assessment-Indonesian Version (MoCA-INA) score. All elligible patient requires to fill the questionaire.

CD4 measurement: CD4 measurement was done through blood sampling and analyzed using flowcytometry.

Statistical Analyses: Statistical analyses were performed using IBM SPSS Statistics 25.0. Data are considered significantly different if $p<0.05$. Non-parametric data were evaluated and compared using the chi-quare test.

Findings:

Demography of HIV patients: The demographic characteristics (age, gender, level of education, and ethnicity) and the clinical characteristics (body mass index, vascular risk factors, and CD4 counts) of the study participants are shown in table 1 and 2.

Table 1: Characteristic of the study participant

Variables (N = 72)	n (%)	Mean ± SD
Gender		
Male	43 (59.7)	
Female	29 (40.3)	
Age		**38.22 ± 9.159**
> 50 years	8 (11.1)	
≤ 50 years	64 (88.9)	
Years of education		**12.35 ± 2.738**
Level of education		
Elementary school	1 (1.4)	
Junior high school	15 (20.8)	
Senior high school (and equivalents)	37 (51.4)	
College/University degree	19 (26.4)	
Ethnicity		
Javanese	62 (86.1)	
Madurese	4 (5.6)	
Timor	2 (2.8)	
Malay	1 (1.4)	
Chinese	2 (2.8)	
Ambonese	1 (1.4)	

Table 2: Clinical Characteristics of Study Participants

Variables	**n (%)**	**Mean ± SD**
Body mass index		23.35 ± 4.854 (13.5-34.3)
Overweight - Obese	25 (34.7)	
Underweight- Normal	47 (65.3)	
Vascular risk factors		
Yes	13 (18.1)	
No	59 (81.9)	
CD4 counts		447.4 ± 247.48 (5-1427)
< 200	11 (15.3)	
≥ 200	61 (84.7)	
MoCA-INA score		26.36 ± 2.770 (16-30)
< 26	18 (25)	
≥ 26	54 (75)	

The statistical analyses from the patient demography showed no significant differences for all the confounding factor, hence a multivariate analysis was not necessary. The results for this analyses are presented in table 3.

Table 3: Clinical Characteristics of the Study Participants

	MoCA-INA		**p**	**OR (95%CI)**
	Impaired (%)	**Normal (%)**		
Age				
> 50 years	4 (22.2)	4 (7.4)	0.101	3.571 (0.791-16.123)
≤ 50 years	14 (77.8)	50 (92.6)		
Gender				
Female	7 (38.9)	22 (40.7)	1.000	0.926 (0.311-2.759)
Male	11 (61.1)	32 (59.3)		
Level of Education				
Elementary-high school	12 (66.7)	41 (75.9)	0.539	0.634 (0.198-2.026)
College/University degree	6 (33.3)	13 (24.1)		
Body Mass Index				
Overweight- obese	6 (33.3)	19 (35.2)	1.000	0.921 (0.298-2.845)
Underweight - Normal	12 (66.7)	35 (64.8)		
Vascular Risk Factors				
Yes	2 (11.1)	11 (20.4)	0.495	0.489 (0.097-2.450)
No	16 (88.9)	43 (79.6)		

Comparison between CD4 criteria on the HIV patient with cognitive impairment and normal function showed a significant differences (p = 0.023) with an odds ratio of 4.900 (95% CI, 1.278 – 18.793). Sugessting that low CD4 may increase the risk of cognitive impairment by 4.9 times. The result can be seen on the table 4.

Table 4: Comparison between CD4 Group and Cognitive Impairment

	MoCA-INA		**p**	**OR (95%CI)**
	Impaired (%)	**Normal(%)**		
CD4 Counts			0.023	4.900 (1.278-18.793)
< 200	6 (33.3)	5 (9.3)		
≥ 200	12 (66.7)	49 (90.7)		
Total	18 (100)	54 (100)		

Discussion

This research showed that HIV patient with the CD4 counts of <200 cells/mm^3 are at 4.9 times higher risk of having impaired cognitive function based on MoCA-INA scoring system compared toHIV patient with CD4 counts of ≥ 200 cells/mm^3. Similarly, previous research also showed that CD4 level is a good predictor for HAND (HIV-associated Neurocognitive Disorder) which showed the p-value of 0.003 and odds ratio of 3.45 (95% CI, 1.51 – 7.91).[8] Another study also reported that the higher CD4 level is correlated with better cognitive function among HIV-AIDS patients evaluated using MoCA-INA (r = 0.347).[9] This suggested that HIV patient with low CD4 counts consistently showed increased risk of cognitive impairment, which should be screened properly.

The mechanism which responsible for the increased risk of cognitive impairment in the patient with low CD4 count is not fully explored in this research. However, we speculate that low CD4 level results in decreased systemic immunity among HIV patients and predisposes to the proliferation of the virus within the CNS.[5] A series of molecular processes will occur and result in both direct and indirect cellular death of the nervous system. The direct mechanism of cellular death involves neurotoxic effects exerted by the viral protein released from the infected monocytes and cause neural cell death via direct interaction between the viral protein and the neuron (gp120, Tat, and Vpr).[10]

On the other hand, the indirect cellular death mechanisms involve neurotoxic processes from the macrophages. The activated macrophages and microglial cells (in response to HIV infection or exposure to the viral particles) will secrete a number of mediators which consist of arachidonic acid and quinolinate, nitric oxide (NO), platelet activating factor, superoxide anions, matrix metalloprotease, chemokines, and pro-inflammatory cytokines including tumour necrosis factor (TNF). Subsequently, the cytokines and other substances released during this process, will interfere with neuro-protective function of the astrocytes (to maintain the blood brain barrier integrity and glutamate reuptake) as well ass increase the rates of apoptosis of the astrocytes.[10]

In addition, neurotoxic processes induced by the host factors, including secretion high amount of amino acids such as glutamate (an excitatory neurotoxic neurotransmitter at the very high level) and other N-methyl-D-Aspartate (NMDA) receptor agonists can create an excitotoxic environment that produces excessive NMDAR activation. Consequently, the intra-neuronal calcium concentration will reach the toxic level and lead to production of free radicals, including Reactive Oxygen Species (ROS) and NO as well as cellular death. These three processes subsequently lead to neural damage/cell death and eventually result in cognitive impairment/HAND.[10]

Clinical implication of this study is that patients with CD4 counts of <200 cells/mm^3 needs a baseline cognitive function assessment since their diagnosis of HIV infection. In order to implement these results, cohort studies are required to analyze the correlation and regression between CD4 counts and cognitive impairment among HIV patients.

Conclusion Patient with Low CD4 level of less than200 cells/mm^3 will have increased risk of cognitive impairment assessed byMoCA-INA scoring system. These suggested that the HIV patient with low CD4 should be screened for cognitive impairment to provide early prevention and treatment.

Conflict of Interest: The authors declare no conflict of interest

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Ethical Clearance: The research was conducted in accordance with the Helsinki declaration of 1975 as revised in 2000. All participating patient has signed written informed consent. The study protocol has been approved by the local ethics committee. Data which shows patient personal information was omitted.

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Antibacterial Effect of the Combination of Probiotic Milk and Calliandra Honey against Streptococcus Mutans that Causes Tooth Cavities

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Abstract

Background: *Streptococcus mutans* is a Gram-positive bacterium found in the oral cavity. As a cariogenic bacterium, *Streptococcus mutans* can cause dental caries through its ability to produce an acidic environment that can demineralize tooth structures so that the tooth layer is destroyed.

Objective: To determine the optimal combination of probiotic milk *Lactobacillus paracasei* and calliandra honey which has antibacterial activity in *Streptococcus mutans* bacteria.

Method: This study uses diffusion method on Nutrient Agar media. The study began with an examination of the physical properties of probiotic milk and calliandra honey including color, odor, taste, pH, specific gravity and viscosity. Antibacterial activity was indicated by the diameter of the Zone of inhibition (mm) in the form of clear areas around the well on the media so that containing Streptococcus mutans inoculums 0.25µl/ml.

Result: The combination of probiotic milk *Lactobacillus paracasei* and 50% calliandra honey solution produced the highest activity at a ratio of 8: 2 with Zone of inhibition diameters of 16.40 ± 0.71 mm

Conclusion: The combination of probiotic milk and calliandra honey with 5% concentration and 8: 2 ratio has the highest antibacterial activity against Streptococcus mutans that causes tooth cavities

Keywords: *Streptococcus mutans, antibacterial activity, probiotic milk, Lactobacillus paracasei, calliandra honey.*

Introduction

Streptococcus mutans is a normal flora in the oral cavity that can turn into a pathogen when there is an excessive number colonies(1). Streptococcus mutans is an anaerobic bacterium that is known to produce lactic acid as part of its metabolism and is able to attach to the tooth surface in the presence of sucrose which causes caries in the teeth(2). Streptococcus mutans produces lactic acid through a *homo-fermentation* process, forming colonies that are firmly attached to the tooth surface and more acidogenic than other species so that it can cause demineralization of tooth enamel at a critical pH of 5.5. Continuous tooth enamel demineralization will cause dental caries(3).

Several studies show that probiotic bacteria have an influence in the ecology of the oral cavity. There are several strains of probiotic bacteria that have a positive effect in reducing the number of Streptococcus mutans in the saliva of the human oral cavity, namely the acidogenic class of Lactobacillus and Bifidobacterium(4).

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The combination of Lactobacillus paracasei and Bifidobacteriumlongum isolates was able to inhibit the growth of Streptococcus mutans[5].

In its development, probiotic bacteria are packaged in a probiotic product with added milk to meet the nutritional needs of these bacteria[6]. Probiotics have proteolytic and lipolytic enzymes that can make milk as a substrate and produce a variety of energy sources [7].

As an antibacterial agent, probiotic milk and honey have different mechanisms, so that a combination of both can affect both activities Antibacterial activity of combination probiotic milk Lactobacillus paracasei and Calliandra honey in inhibiting the growth of Streptococcus mutans are not known, so it needs to be done research to determine the antibacterial activity of the combination of probiotic milk Lactobacillus paracasei ATCC BAA52 and Calliandra Honey (Calliandracalothyrsus) against Streptococcus mutans in various comparisons[8]. Based on this background, this study aims to determine the combination of probiotic milk Lactobacillus paracasei ATCC BAA52 and Calliandra honey (Calliandracalothyrsus) which can provide maximum antibacterial activity against Streptococcus mutans.

Material and Method

Materialsand Equipments: The materials are Media Nutrient Agar (Oxoid), Agar de Man Ragosa Sharpe (MRS), Calliandra honey from Yogyakarta, milk, NaCl (Merck), Klindamisin, sterile distilled water and membrane filter with a size of 0.22 µm. The equipments are analytical scales, glassware, petri dishes, micro pipettes (Socorex), öse wire, ependorf, vortex (Type 161700 mixer), incubator (Memmert), vernier caliper, colony counter, shaker, refrigerator, picnometer, viscosity ostwald, viscosity Cup and Bob, autoclave (HL-340 series sterile vertical type steam), pH meter (Schott glass mainz CG 842 type), laminar air flow cabinet, lactodensimeter, and spectrophotometer (Thermo Fisher Scientific 5225 Verona Road).

Agar well diffusion method: Test bacteria aged 18-24 hours are suspended into the agar medium at around 45oC. The bacterial suspension is poured into a sterile petri dish. After the agar becomes solid, holes are made with a diameter of 6-8 mm. Into the hole, a solution of the substance is inserted which will be tested for 20 µL of activity, then incubated at 37oC for 18-24 hours[9].

Results

Table 1: Observation Result of Zone of inhibition diameter of probiotic milk at various concentrations (%) on the growth of mutant Streptococcus.

Probiotic milk concentration	Zone of inhibition diameter (mm)
	Mean ± SD
100%	9,92 ± 0,52
80%	9,50 ± 0,36
70%	9,12 ± 0,10
60%	9,07 ± 0,09
55%	9,32 ± 0,08
50%	-
25%	-
Clindamycin 0,01 ppm	32,33±0,47

From these data, it can be seen that the minimum inhibitory concentration is produced by Lactobacillus paracasei probiotic milk at a concentration of 55.00%, which results in an average diameter Zone of inhibition of 9.3 ± 0.08 mm and at a concentration of less than 55.00% there is no Zone of inhibition. The minimum inhibitory concentration was produced by probiotic milk Lactobacillus paracasei at a concentration of 55% so that for the next combination carried out at the concentration of probiotic milk Lactobacillus paracasei ATCC BAA52 was above 55%.

Table 2: Observation result of Zone of inhibition diameter of calliandra honey at various concentration (%) against Streptococcus mutans

Calliandra Honey Concentration	Zone of inhibition diameter (mm)
	Mean ± SD
50%	24,42±0,42
40%	23,20±0,12
30%	22,28±0,06
25%	21,18±0,12
12,5%	-
6,25%	-
Clindamycin 0,01 ppm	19,12±0,01

From these data, it can be seen that the minimum inhibitory concentration is produced by calliandra honey at a concentration of 25%, which results in an average diameter Zone of inhibition of 21.18 ± 0.12 mm and a concentration less than 25% there is no Zone of inhibition. Based on the table above, the minimum inhibitory concentration is produced by calliandra honey (Calliandracalothyrsus) at a concentration of 25%, so that the next combination is carried out at the concentration of calliandra honey above 25%.

Table 3: ZOI diameter observation of Combination of Probiotic Milk and calliandra Honey to Streptococcus mutans

Combination (Probiotic: Honey)	Zone of Inhibition Diameter (mm)			Mean ± SD
	1st Replication	2nd Replication	3rd Replication	
1 : 9	9,20	10,00	11,00	10,07±0,74
2 : 8	12,35	13,00	13,15	12,83±0,35
3 : 7	11,40	12,35	13,00	12,25±0,66
4 : 6	12,35	13,10	13,10	12,85±0,35
5 : 5	12,35	13,25	14,10	13,23±0,71
6 : 4	13,30	14,00	14,00	13,77±0,33
7 : 3	12,30	12,35	12,35	12,33±0,02
8 : 2**	15,40**	16,80**	17,00**	16,40±0,71**
9 : 1	15,00	15,20	16,10	15,43±0,48
Calliandra Honey	15,40	15,00	14,90	15,10±0,35
Probiotic milk	14,60	13,60	12,00	13,40±1,84
Clindamycin	21,00	21,00	21,00	21,00±0,00

From these data, it can be seen that the maximum ZOI diameter is produced by a combination of L. paracasei probiotic milk and calliandra honey at a ratio of 8: 2 which results in a diameter of the Zone of inhibition greater than the other comparison which is 16.40 ± 0.71 mm. The maximum antibacterial activity is indicated by the combination of Lactobacillus paracasei probiotic milk and 50% calliandra honey at a ratio of 8: 2 which has the largest Zone of inhibition diameter, then one-way anova statistical test (attachment 10) to determine the difference in diameter significance the average zone of inhibition (ZOI) between each group is presented in Table 4.

Table 4: Differences in ZOI Diameter mean value of Combined Zone of Probiotic L.paracasei and Calliandra Honey against S. mutans according to HSD Test

Kel	1:9	2:8	3:7	4:6	5:5	6:4	7:3	8:2	9:1	M	S	K
1:9		2,77*	2,18*	2,78*	3,17*	3,70*	2,27*	6,33*	5,37*	5,03*	3,33*	10,93*
2:8	2,77*		0,58	0,02	0,40	0,93	0,50	3,57*	2,60*	2,26*	0,57	8,17*
3:7	2,18*	0,58		0,60	0,98	1,52*	0,08	4,15*	3,18*	2,85*	1,15	8,75*
4:6	2,78*	0,02	0,60		0,38	0,92	0,52	3,55*	2,58*	2,25*	0,55	8,15*
5:5	3,17*	0,40	0,98	0,38		0,53	0,90	3,17*	2,20*	1,87*	0,17	7,77*
6:4	3,70*	0,93*	1,52*	0,92	0,53		1,43*	2,63*	1,17*	1,33*	0,37	7,23*
7:3	2,27*	0,50*	0,08	0,52	0,90	1,43*		0,97*	3,10*	2,77*	1,07	8,67*
8:2	6,33*	3,57*	4,15*	3,55*	3,17*	2,63*	4,07*		0,97	1,30*	3*	4,60*
9:1	5,37*	2,60*	3,18*	2,58*	2,20*	1,67*	3,10*	0,97		0,33*	2,03*	5,57*
M	5,03*	2,26*	2,85*	2,25*	1,87*	1,33*	2,77*	1,30*	0,33		1,70*	5,90*
S	3,33*	0,57	1,15	0,55	0,17	0,37	1,07	3*	2,03*	1,70*		7,60*
K	10,93*	8,17*	8,75*	8,15*	7,77*	7,23*	8,67*	4,60*	5,57*	5,90*	7,60*	

Description: Yellow - Significant different (p<0,05), White - No significant different (p>0,05), M - 50% calliandra honey, S - 100% probiotic milk, K - Positive control (Clindamycin 0,01ppm)

Based on Table 4, it is known that there are differences in the average diameter of the ZOI according to Tukey-HSD for a ratio of 8: 2 with other ratio except 9: 1. But the optimal ratio is also determined by the diameter of the zone of inhibition (ZOI) which is the largest among

the other ratio. So the optimal ratio is shown by the combination of probiotic milk Lactobacillus paracasei and Calliandra honey in a ratio of 8: 2.

Table 5: ZOI diameters of Probiotic Milk Lactobacillus paracasei and Calliandra honey (Calliandracalothyrsus) combination against Streptococcus mutans

Concentration of Probiotic and Calliandra Honey Combination (8: 2)	ZOI diameter against Streptococcus mutans(mm)
	Mean ±SD
100%	17,13±0,23
50%	12,86±0,15
40%	11,03±0,55
Clindamycin 0,01 ppm	36,00±0,00

From these data, it can be seen that the minimum inhibitory concentration of Streptococcus mutans is produced by a combination of probiotic milk Lactobacillus paracasei and calliandra honey with a ratio of 8: 2 at a concentration of 40.00% which is equal to 11.03 ± 0.55 mm and at concentrations less than 40.00% there is no zone of inhibition that generated.

Discussion

From these results, it was found that probiotic milk Lactobacillus paracasei and calliandra hone had antibacterial activity against Streptococcus mutans at a minimum inhibitory concentration (MIC) of 55% and 25%. Calliandra honey has smaller MIC than probiotic Lactobacillus paracasei milk which is 25%, so it can be assumed that Calliandra honey is more potent in inhibiting the growth of Streptococcus mutans than Lactobacillus paracasei probiotic milk[10].

From these results, it can be seen that with a decrease in concentration from 100% to 60% of Lactobacillus paracasei probiotic milk, there was a decrease in the diameter of the inhibition zone, although at 55% concentration of probiotic milk Lactobacillus paracasei increased. The results also showed that Lactobacillus paracasei probiotic milk was able to inhibit the growth of Streptococcus mutans at the lowest concentration of 55% with inhibitory zone diameters of 9.32 ± 0.08 mm, because at concentrations below 50% no inhibition zones were produced.

Based on the research that has been done, the ZOI diameter of probiotic milk Lactobacillus paracasei at a concentration of 100% is 9.92 ± 0.52 mm, while at a concentration of 50%; 25% and 12.5% do not produce inhibition zones. So that the test is continued at a concentration of 80%; 70%; 60% and 55% are produced in succession of inhibitory zone diameters of 9.50 ± 0.36 mm; 9,12 ± 0,10 mm; 9.07 ± 0.09 mm and 9.32 ± 0.08 mm.

Furthermore, the antibacterial activity of a combination of probiotic milk Lactobacillus paracasei and calliandra honey was carried out to the growth of Streptococcus mutans. In this study, testing was done with agar diffusion method because in the process it is simple, inexpensive and able to test various types of microorganisms and antibacterial agents with easy results of interpretation techniques[11].

According to Ghabanchi in his research, antibacterial activity was shown by the presence of an inhibition zone (mm) in the form of a clear area around the well. The inhibition zone shows that Streptococcus mutans are not resistant to the test solution[12]. As a positive control used in testing this antibacterial activity is clindamycin, because the antibiotic is known to be sensitive to gram-positive, facultative anaerobes and has been shown to inhibit the growth of oral bacteria, especially Streptococcus mutans[10].

Based on the research by Bhushan and Chachra (2010), it was said that some probiotic bacteria act as bacteriocin or like inhibitors specifically preventing the growth of cariogenic bacteria, having the ability to protect teeth and affect the growth of supragingival plaques. Adhesion reduction can be an effective way to reduce cariogenic bacteria such as Streptococcus mutans[13].

The effect of osmotic pressure from honey is related to saturated solutions of sugar with water content usually only around 15-21% of its weight. Solids in honey, 84% is a mixture of monosaccharides namely fructose and glucose[14]. The strong interactions between sugar molecules produce water molecules that are not enough for microorganisms. Microorganisms will lose water from this osmosis process and will become dehydrated, so it can kill these microorganisms. Gluconic acid is the most dominant acid[15]. This acid is the result of enzymatic changes in glucose by the glucose oxidase enzyme, which bees secreted from the hypopharyngeal gland becomes a balance between gluconic acid and gluconolactone[16].

Conclusions

Based on the results of the study, it can be concluded that the MIC of probiotic milk Lactobacillus paracasei ATCC BAA52 against Streptococcus mutans was 55%. WhiletheMICofcalliandra(Calliandracalothyrsus)honey against Streptococcus mutans is 25%. The combination of probiotic milk Lactobacillus paracasei ATCC BAA52 and Calliandra honey (Calliandracalothyrsus) can provide maximum activity against Streptococcus mutans in a ratio of 8: 2. The combination MIC of probiotic milk Lactobacillus paracasei ATCC BAA52 and Calliandra honey (Calliandracalothyrsus) against Streptococcus mutanswas 40%.

Ethical Clearance: The research process did not involve with human, instead it is only laboratory research of parasites that is in accordant with the ethical research principle based on the regulation of research ethic committee. The present study was carried out in accordance with the research principles. This study implemented the basic principle ethics of respect, beneficence, non-maleficence, and justice.

Conflict of Interest: The author has not received any conflict of interest so far. It is safe from the conflict

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Reproductive Health Behavior of Street Youth Guided by Karya Putra Indonesia Mandiri Foundation in Central Jakarta Region

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Abstract

Background: Adolescents psychologically have a negative self-concept that is easily influenced and tends to behave freely. This study aims to determine whether there is a relationship between the role of parents and the role of friends with the reproductive health behavior of street adolescents. The problem with this research is the high rate of teenage pregnancy in Indonesia and adolescents account for 30% of unwanted pregnancies and unsafe abortions.

Material and Method: Cross sectional research design. The sample in this study was YPKIM fostered adolescents aged 15-19 years. Data processing and analysis using chi square test and multiple logistic regression.

Findings and Discussion: Poor reproductive health behaviors in YPKMI street adolescents by 33.3%. Based on the results of bivariate analysis found there is a relationship between the role of parents and the role of friends with reproductive health behavior. Multivariate analysis shows that knowledge is the most dominant risk factor associated with reproductive health behavior (OR = 6,610).

Conclusion: The results of this study prove the need to increase reproductive health knowledge in street adolescents to improve reproductive health behavior better by creating programs specifically for the coaching of adolescents, especially street adolescents.

Keywords: *Reproductive health, Sexual behavior, Street youth.*

Introduction

Adolescent relationships today tend to be free and experience a shift in values, where adolescence is a critical period where changes in emotions, thoughts, social environment and responsibilities are experienced[1]. Sexual Behavior is any behavior carried out because of sexual urges. In this concept no matter how and with whom or what that impulse is released. In adolescent sexual behavior, open communication with parents seems to be importan. Teenagers need sex education from older people to access contraception or refuse peer calls or partners to have sex before they are ready. In the US, public health activities to improve open communication between parents and adolescents to produce positive adolescent health. Not all sexual relations are voluntary, especially for girls, but also because of coercion among women aged 17 years, according to data from the National Survey of Children, there are 7% who are forced to have sexual relations[2].

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Sexually transmitted infections (STIs) and unwanted pregnancies are very important public health problems, although in the long term they are needed to prevent them. Because there are a number of risk factors for STIs, prevention includes the delays in the emergence of sexual relations between teenagers who are actively engaging in sexual relations[3]. In 2012, an estimated 2.1 million adolescents were living with HIV. Despite effective interventions to prevent and treat HIV, adolescents face difficulties in accessing it. As a result the emergence of new infections among adolescents infected with HIV is common. Programs designed specifically for HIV-positive adolescents must focus more on interventions that have proven to be more effective in overcoming fundamental factors that drive incidents and the lack of effective care and care in this age group.

In adolescent sexual behavior, open communication with parents seems to be important[4], Because teenagers need sex education from older people to access contraception or refuse peer calls or partners to have sex before they are ready. In the US, public health activities to improve open communication between parents and adolescents to produce positive adolescent health. Not all sexual relations are voluntary, especially for girls, but also because of coercion among 17-year-old women in the National Survey of Children, 7% are forced to have sexual relations. Data from research from Katherine in 2003, parents who communicate with their daughters about sex will influence sexual behavior in a more positive direction. A family-based approach to improving communication can reduce the risk of risky sexual risk-related behaviors related to HIV[5].

The halfway house is a temporary informal camp, where street children meet to get information and initial guidance before being referred to further development processes. The purpose of establishing a halfway house is to re-socialize to reshape children's attitudes and behaviors that are in accordance with the values and norms prevailing in society and provide early education to meet the needs of children and prepare their future so that they become productive societies. Of the dozens of Shelter Houses that carry out street youth development in the DKI Jakarta area and in the Central Jakarta area there are five Shelter Houses Foundation, two of which are still active to date and one of them is shelter Yayasan Karya Putra Indonesia Mandiri (YKPMI). Based on observations made by researchers together with interviews with the Chairperson and Staff of the YKPMI Shelter Foundation, the 2014 data of the YKPMI Shelter Foundation has 215 street children assisted in 10 points in Central Jakarta and East Jakarta.

Material and Method

This type of research is a quantitative study using a cross-sectional approach, which is a study that studies the relationship between the role of parents and the role of friends on the reproductive health behaviors of YKPMI street adolescents by observation or data collection at the same time.

This research is a descriptive-analytic study using the quantitative cross-sectional method used to analyze the relationship between parental role variables and the role of friends on reproductive health behaviors in street children fostered by YKPIM in the Central Jakarta Region in 2015.

The sample in this study has the characteristics of inclusion, namely street children fostered by YKPMI in Central Jakarta and East Jakarta, aged 15-19 years and came to YKPMI at the time determined by the researcher. The exclusion characteristics in this study were adolescents aged <15 years and street adolescents who could not read and write.

Findings and Discussion

Univariate Analysis: Univariate analysis is used to look at quantitative data obtained from descriptive research, using tables, graphs and measures of central tendencies, such as the mean or average value of each variable.

The assessment results found that most of the street adolescents fostered by the Karya Putra Indonesia Mandiri foundation had good reproductive health behaviors as many as 40 people (66.7%) and only a small proportion were behaving less well, 20 people (33.3%).

Table 1: Frequency Distribution of Street Youth Assisted by Karya Putra Indonesia Mandiri Foundation according to Reproductive Health Behavior in Jakarta

Reproductive Health Behavior	Total (n)	Percentage (%)
Poorly	20	33,3
Well	40	66,7
Total	60	100

Based on the results of table 1 analysis, it is known that most of the street adolescents fostered by Karya Putra

Indonesia Mandiri Foundation have good reproductive health behaviors, as many as 40 people (66.7%) and only a small portion whose behavior is not good, namely 20 people (33.3%). This study is consistent with Joseph's research findings that the lack of knowledge about reproductive health will affect health behaviors in adolescents[6].

Table 2: Frequency distribution of YKPIM-assisted street teenagers based on the role of parents and the role of friends in Jakarta

Variable	Total (n)	Percentage (%)
The role of parents		
Fewer roles	20	33,3
Most of the roles	40	66,7
The role of Friends		
Fewer roles	18	30,0
Most of the roles	42	70,0

Based on the results of table 2, it is known that the frequency distribution of the role of parents of YKPMI street teenagers is that most of the roles of parents are mostly 40 people (66.7%) and a small part has fewer roles, 20 people (33.3%). The distribution of the role of YKPMI street adolescent peers mostly played 42 people (70%) and a small part has fewer roles that 18 people (30%).

Bivariate Analysis: Bivariate analysis was performed to see the relationship between each independent variable with the dependent variable, namely reproductive health behavior using a statistical test, the Chi Square test. Bivariate analysis was used in this study as a method to see the relationship between the reproductive health predisposing variables of street children who are under the guidance of YKPIM Jakarta.

Table 3: Relationship between the role of parents and the role of friends with reproductive health behaviors

Variable	Reproductive Health Behavior				Total		OR (95% CI)	p-value
	Poorly		Well					
	n	%	n	%	n	%		
The Role of Parents								
Fewer roles	12	60,0	8	40,0	20	100	6,000	0,005
Most of the roles	8	20,0	32	80,0	40	100	(1,837-19,594)	
The Role of Friends								
Fewer roles	12	66,7	6	33,3	18	100	8,500	0,001
Most of the roles	8	19,0	34	81,0	42	100	(2,444-29,562)	

Based on the results of the analysis in Table 3 shows that in YKPMI street adolescents, it is known that there are 60.0% of teenagers who lack the role of parents, the behavior is not good, while in the youth group who feel the role of parents there are only 20.0% of bad behavior. Statistical test results obtained p-value 0.005 meaning that there is a significant relationship between the role of parents with reproductive health behavior. The results of the analysis obtained OR 6,000 means that a group of adolescents who do not feel the role of parents has a 6 times greater chance to have bad behavior than adolescents who feel the role of parents.

The results of the analysis showed that in the street adolescents guided by YKPMI, it was found that in the group of teenagers who felt the lack of the role of friends there were 66.7% whose behavior was not good whereas in the group of adolescents who felt the role of friends there were only 19.0% whose behavior was not good. statistics obtained P value 0.001 means that there is a significant relationship between the role of friends with reproductive health behavior. The analysis results obtained OR 8,500 means that the group of adolescents who do not feel the role of friends has a 8.5 times greater chance to have bad behavior than adolescents who feel the role of friends.

The results of this study are consistent with the results of Jennifer's research that parent and teen communication about reproductive health has an important role in improving reproductive health in adolescents[7].

Multivariate Analysis: Multivariate analysis used is multiple logistic regression test, the steps being carried out are as follows: selection of predictive model candidates. Multivariate analysis in this study was conducted to see the most dominant independent variables related to the dependent variable simultaneously, because the independent variables are categorical and the dependent variables are dichotomous categories, so the analysis conducted is multiple logistic regression. Variables that have been analyzed bivariately and have a p value <0.25 are used as candidate variables to be included in the next analysis multivariately, to determine the best model. The results can be seen in table 4 below.

Table 4: Results of variable analysis as a candidate model

Variable	p-value	Explanation
The role of parents *	0,003	Following the Multivariate
The Role of Friends*	0,001	Following the Multivariate

The results of bivariate tests that have been done previously, it is known that of the eight variables, there are four variables that can be included in multivariate analysis, namely knowledge, attitudes, the role of parents and the role of friends (p-value <0.25). Other variables (age, gender, education and media access) have p-values >0.25 so they are not included in the multivariate analysis.

Conclusions

Communication that occurs between adolescents and parents is very lacking so that there is a failure of family function, this triggers adolescents to behave freely and even violate the norms, because they feel no one cares or prevents it. Lack of appropriate sources of information from the mass media, health workers, religious leaders, religious leaders and peers causes adolescents to obtain information and choose the wrong actions so that they regret after pregnancy after having premarital sex. Although premarital sexual behavior is at risk of being influenced by individuals and the environment, sometimes parents are met who do not regret the pregnancy that occurs in their children.

Conflict of Interest: There is no conflict of interest to be declared.

Source of Funding: Self or other source

The source of funding for this research came from private funds

Ethical Clearance: This research was approved by Karya Putra Indonesia Mandiri Foundation (518/B.04.02/2015) and Postgraduate University Prof. Dr. Hamka (No. 103/SK/Mp-Mhs/YKPIM/X/2015**).**

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Trend of Malaria Cases in Maluku Province 2012-2016

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Abstract

Malaria is a worldwide problem, including in Indonesia. Malaria is a vector-borne disease, and the vector is *Anopheles* mosquito. In Indonesia, the most endemic are located in the eastern regions of Indonesia. Maluku Province had the fourth highest rate of Annual Parasite Incidence (API) in 2015 at 5.81%. This research was quantitative with a descriptive analysis of malaria positive cases in Maluku. The study used secondary data from January 2012 to December 2016 that were obtained by the Health Office of Maluku. The result of this research shows that the trend of malaria, according to the current rate of positive cases found, tends to decrease every year with R square value from the linear line of 0.5534. The lowest number of cases was recorded in February. Based on gender, malaria on both genders tends to decrease every year. Maluku Barat Daya Regency had the highest rate of Annual Parasite Incidence (API) among other regencies in Maluku. As a suggestion, the government should be more concerned about the prevention program of malaria in Maluku Province. Some of the preventive ways are to disseminate knowledge to the community that if they want to do activities outside at night, they have to wear long clothes that can cover the whole body.

Keywords: *Malaria cases; API; Maluku.*

Introduction

Malaria is a disease caused by five different Plasmodium parasites that are transmitted to humans through the bite of an infected female *Anopheles* mosquito. Malaria can infect all ages and genders. A person who is infected will feel fever, shiver, sweat, have headache, have nausea, and vomit. A person with clinical symptoms has to get a laboratory test to confirm the positive status of malaria [(1)]. Malaria is considered as a threat to the gains in health and development and the attainment of the 2030 Agenda for Sustainable Development because of the high number of people at risk of the infection. More specifically, the third goal of the Sustainable Development Goals (SDGs) is "Good Health and Well-Being", so malaria as a communicable disease and the epidemic which it brings have to be eliminated and ended by 2030[(2)]. All heads of the states in the Asia Pacific region, including Indonesia, have committed to the complete elimination of malaria in their respective countries by this time as well [(3)].

In Indonesia, the most endemic areas are found in the eastern regions of Indonesia. Maluku is also located in the eastern region of Indonesia. Malaria is the main problem in some areas, including Maluku. Maluku Province had the fourth highest rate of Annual Parasite Incidence (API) in 2015 at 5.81%. Maluku is also categorized as HCI (High Cumulative Incidence) area in Indonesia [(1)].

Malaria was one of the ten most common diseases in Maluku. Based on a report from the 2014 Maluku Health Profile, the Annual Parasite Incidence (API) from 2008 to 2014 fluctuated, while in 2008 the API was 12.3/1000 citizens. That number decreased in 2009 to 7.0/1000 citizens and increased in 2010 to 10.4/1000 citizens. In 2011, the API decreased again to 9.1/1000 citizens and increased again in 2012 to 11.1/1000 citizens.

Based on the data, API in Maluku did not show a stable decreasing trend. Therefore, the province needs a comprehensive scheme of malaria prevention which

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includes effective promotional, preventive, and curative efforts. It aims to reduce morbidity and mortality and to prevent outbreaks. To achieve optimal results, the preventive and curative efforts should be carried out professionally and integrated with other programs.

Maluku Province is a malaria endemic area, and currently a program referral system that refers to the cluster system is being developed. Enforcement of clinical malaria diagnosis (without laboratory confirmation) will provide an overview of the clinical malaria rate occurring in the target community [4]. After reviewing the available data, the researcher took interest in performing a research project to investigate the trend of malaria cases in Maluku from 2012 to 2016.

Method

Maluku was chosen as a location for this study because Maluku is one of the endemic areas of malaria. This research was quantitative with a descriptive analysis of malaria positive cases in Maluku. Descriptive analysis is conducted to know the existence of independent variables, either only one or more variables (stand-alone variables), without making comparisons and searching the relationship between that variable and another variable [5].

The study used secondary data from January 2012 to December 2016 that were obtained by the Health Office of Maluku. Data were analyzed by numerical processing software. The study also obtained a body of data concerning malaria positive cases based on gender, minimum and maximum monthly cases, Annual Parasite Incidence (API) from every city/regency in Maluku from 2012 to 2016, and the type of Plasmodium. The trend of malaria is presented in several figures as the results of this study.

Findings: The results of this research show that the trend of malaria, according to the rate of positive cases found, tends to decrease every year with R square value from linear line of 0.5534. It means that the model fits to 55.34%. The maximum number of malaria cases was recorded in a different month in different year. In 2012, the highest number of cases was recorded in March with 1947 positive cases. In 2013, the highest number of cases was recorded in May with 1980 cases. Moreover, in 2014, the highest number of malaria cases was recorded in April with 1913 cases. In 2015, the highest number of cases was recorded in February with 1080 cases, while in 2016, the highest number of cases was recorded in December with 1484 cases (Figure 1).

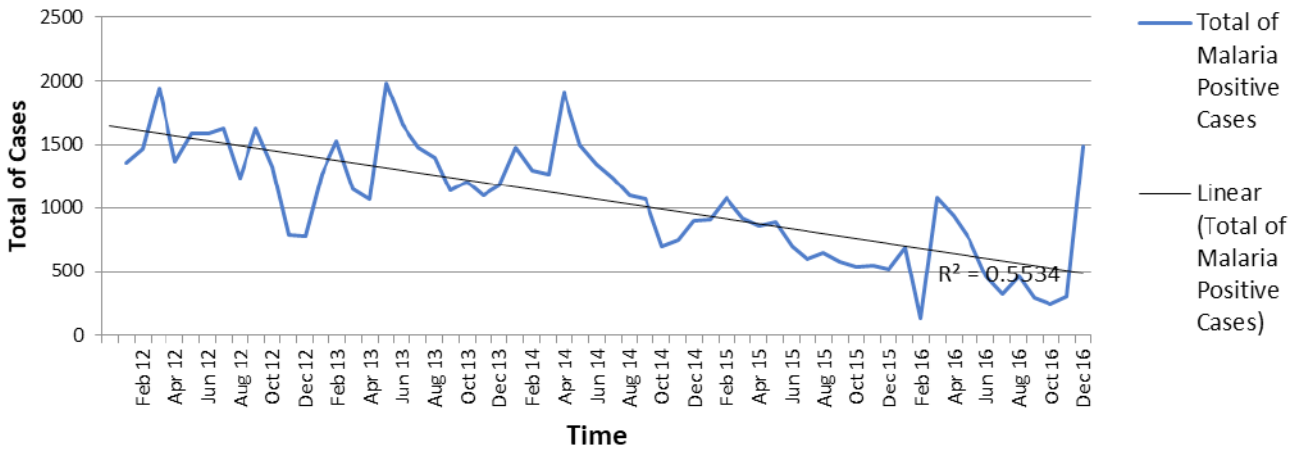


Figure 1: Malaria Positive Cases in Maluku

In contrast to the seemingly irregular occurrence of maximum number of malaria cases in each year, the monthly data about the minimum and maximum of malaria cases from 2012 to 2016 (Figure 2) show that the lowest number of cases was recorded in February. It means that rainfalls during the rainy season can also decrease malaria cases because rainfalls helped to eliminate the breeding sites of *Anopheles* [6].

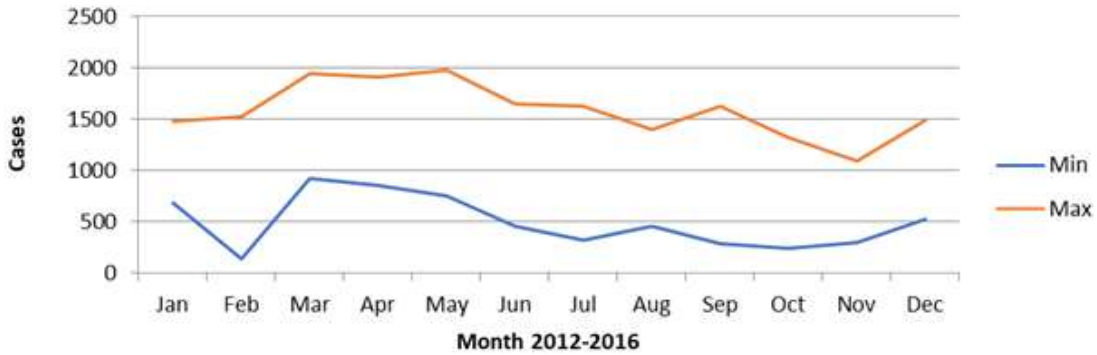


Figure 2: Minimum and Maximum Monthly Malaria Cases in 2012-2016

The trend of malaria which largely decreased from 2012 to 2016 might show the success of the governmental program to eliminate malaria, especially in Maluku Province. A study by Oktafandi *et al* (2014). found that the number of malaria cases declined every year from 2011 to 2013[7]. Although the trend showed a decrease, Maluku province is still an endemic area of malaria. Based on gender, malaria cases tend to decrease every year in both men and women. Malaria cases in men had R square value from linear line of 0.5247. It means that the model fits to 52.47% (Figure 3). Meanwhile, in women, the value was 0.5708, and it means that the model fits to 57.08% (Figure 4). However, men suffered a higher number of malaria cases than women.

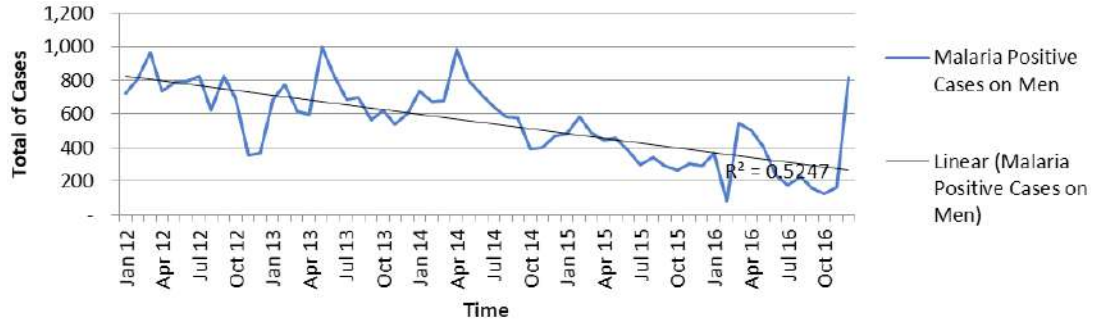


Figure 3. Malaria Positive Cases on Men in Maluku

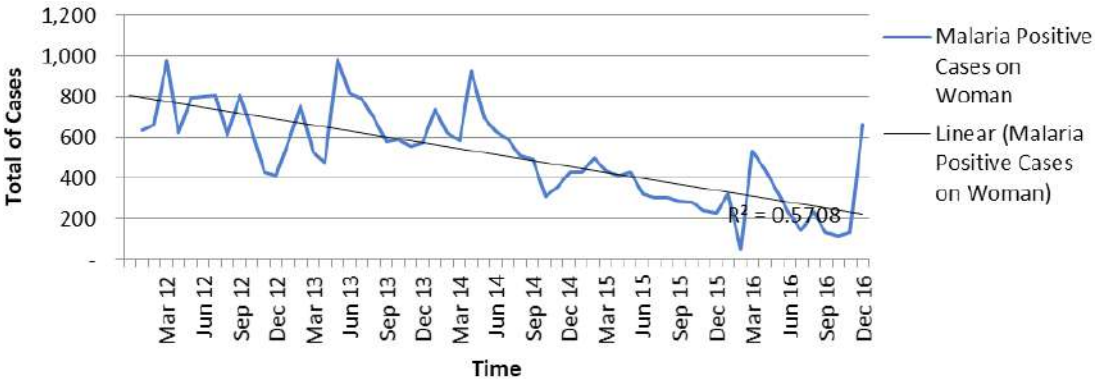
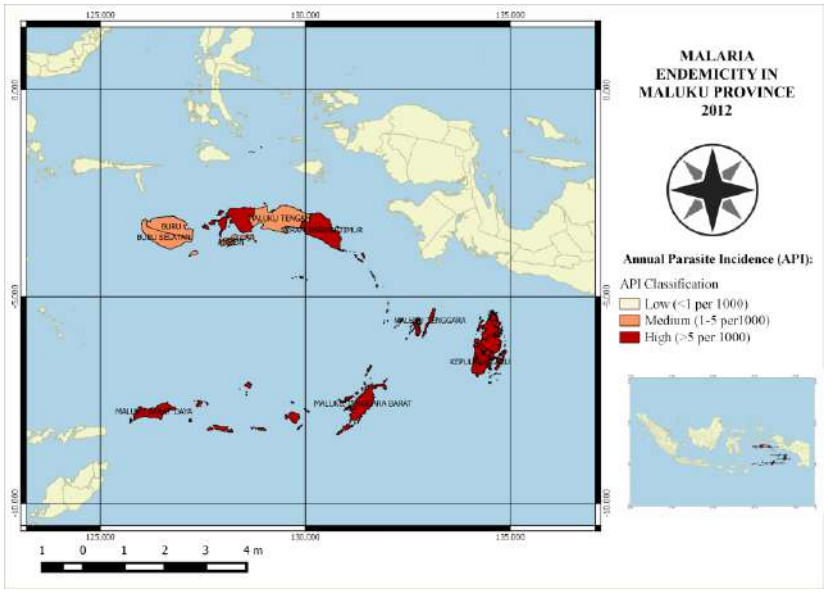
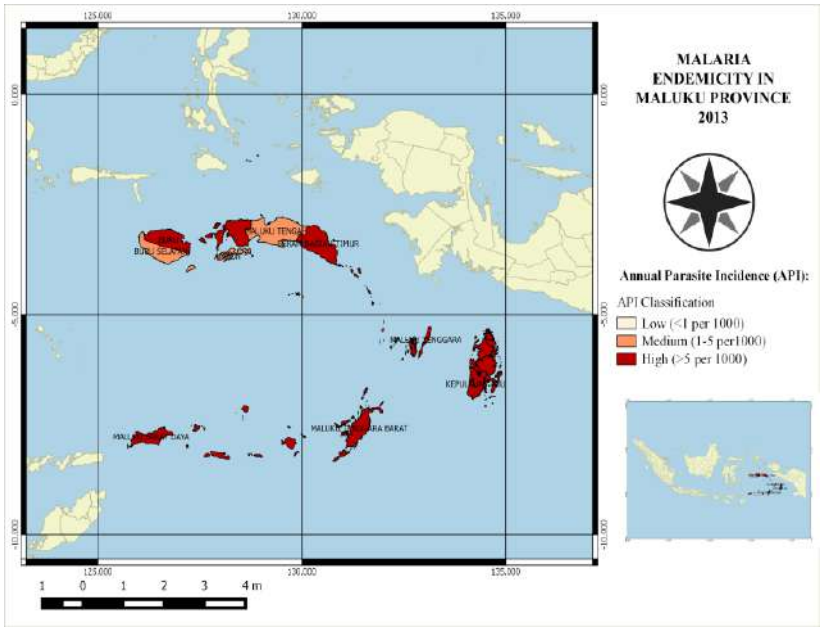


Figure 4. Malaria Positive Cases on Women in Maluku

The number of malaria cases in Maluku Province decreased from 8.31 per 1000 citizens in 2014 to 4.3 per 1000 citizens in 2016. The highest number of malaria cases was found in Maluku Barat Daya (MBD) Regency which was 25.9 per 1000 citizens, and the lowest number was found in Tual City and Buru Regency at 0.6 and 0.9 per 1000 citizens, respectively. According to the result of a study by a health research and healing team, Wetar and Moa Sub-districts were malaria endemic areas with the highest rate of incidence in MBD Regency[8]. In addition to that, the API in eleven cities/regencies in Maluku varied every year between 2012 and 2016 (Figure 5).


MALARIA
ENDEMICITY IN
MALUKU PROVINCE
2012
Annual Parasite Incidence (API):
API Classification
Low (<1 per 1000)
Medium (1-5 per1000)
High (>5 per 1000)
125.000
130.000
135.000
0.000
-5.000
-10.000
1 0 1 2 3 4 m


MALARIA
ENDEMICITY IN
MALUKU PROVINCE
2013
Annual Parasite Incidence (API):
API Classification
Low (<1 per 1000)
Medium (1-5 per1000)
High (>5 per 1000)
125.000
130.000
135.000
0.000
-5.000
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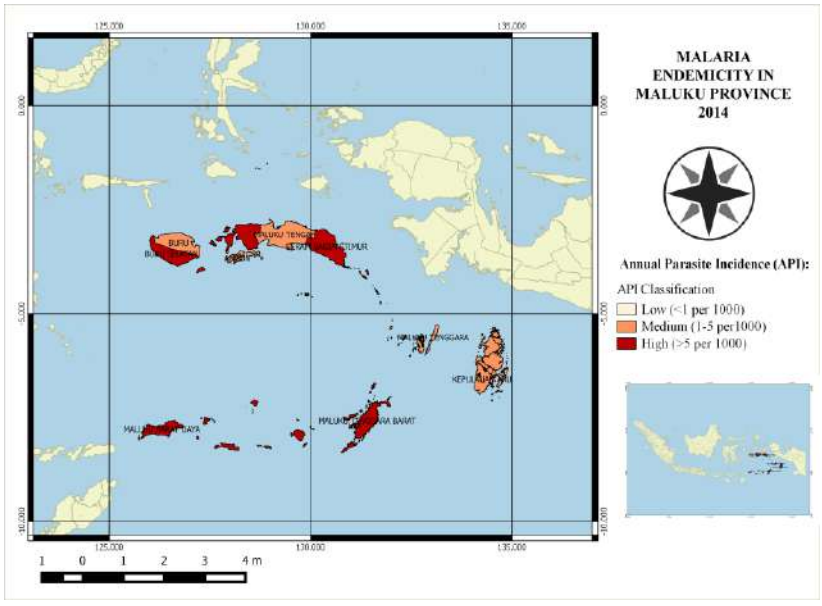
MALARIA
ENDEMICITY IN
MALUKU PROVINCE
2014
Annual Parasite Incidence (API):
API Classification
Low (<1 per 1000)
Medium (1-5 per1000)
High (>5 per 1000)
125.000
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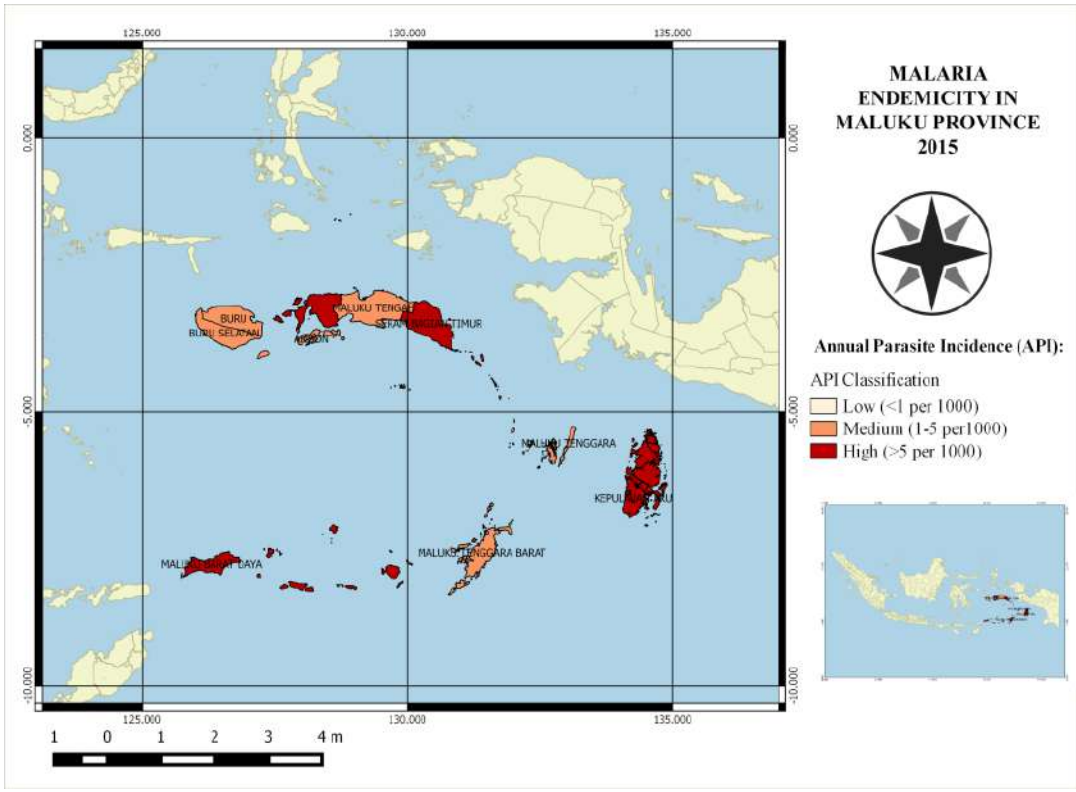

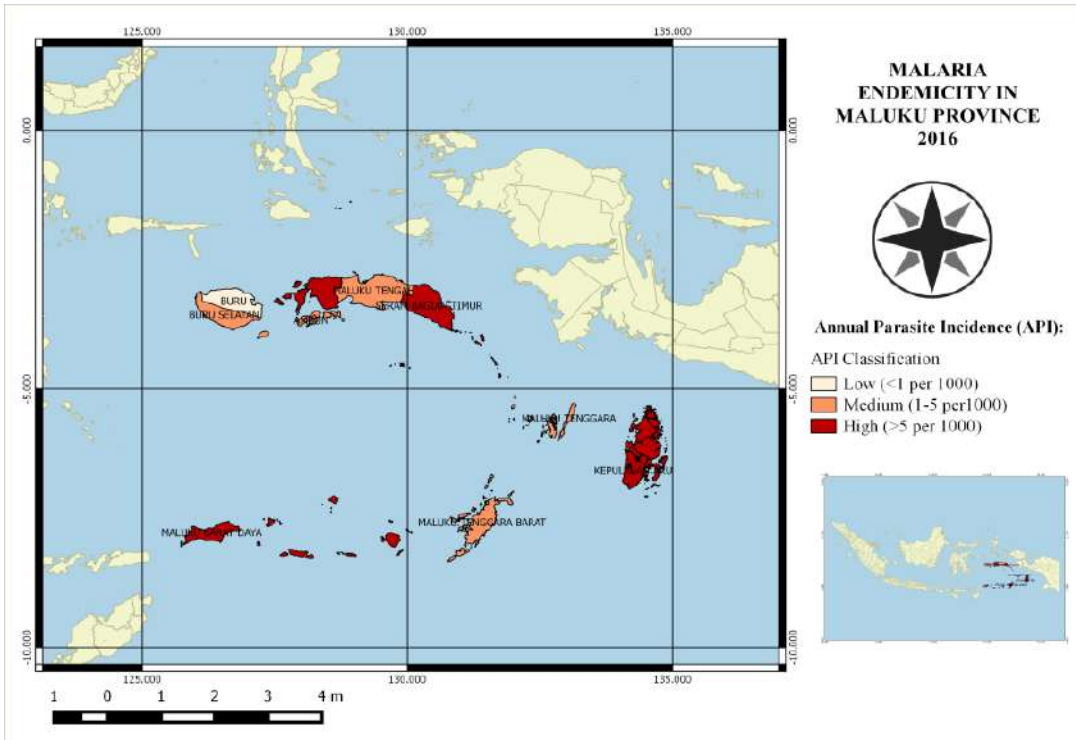

Figure 5: Annual Parasite Incidence (API) in Maluku 2012-2016

Based on current studies, there were four types of *Plasmodium* found in Maluku, while the highest number of malaria incident every year was attributed to *Plasmodium vivax* and the lowest was attributed to *Plasmodium ovale*. The risk of *Plasmodium vivax* malaria occurs almost everywhere, with several exceptional zones or pockets free of malaria risks in Java, Bali, and Sumatra, as well as fewer pockets in Sulawesi and Papua (Figure 6).

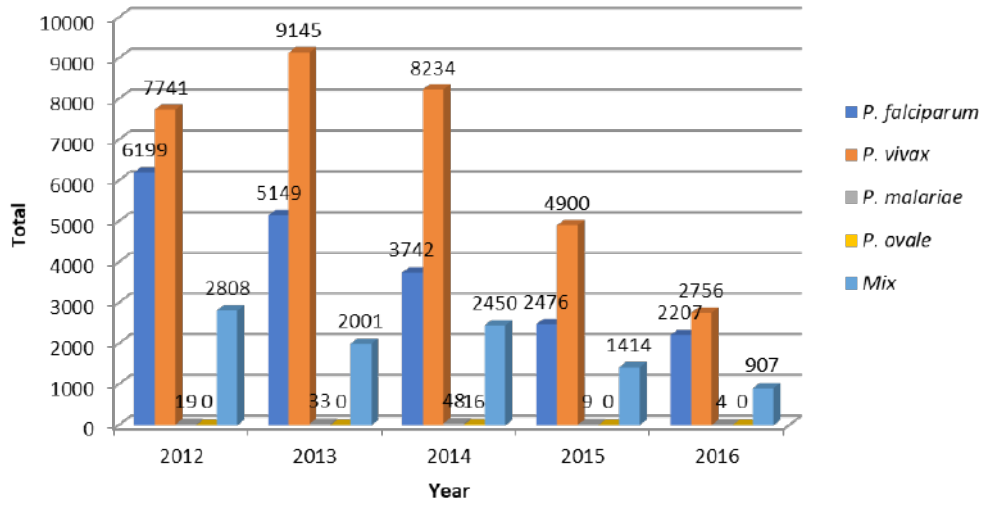

Figure 6. Total Number of Malaria Cases due to Different *Plasmodium* Types in Maluku 2012-2016

Discussion

Malaria is an entirely preventable and treatable disease. It is caused by a protozoan parasite belonging to the genus *Plasmodium*. It is spread from a person to another by *Anopheles* mosquito bites. All efforts to prevent malaria are considered as part of collective contribution to the country's sustainable development. The objectives of reducing and eliminating malaria are intrinsically linked to most Sustainable Development Goals (SDGs) as they comprise nearly all of the Millenium Development Goals (MDGs). Malaria is a result, as well as a cause, of such inhibition of development [(9)].

Maluku is an archipelagic region, which encourages the transmission of *Anopheles* as a vector of malaria. *Anopheles* cannot live in a high area at an altitude of above 2000 meters[(10)]. Maluku is one of the provinces in Indonesia with a high number of malaria cases. Maluku is located in the eastern region of Indonesia and has two main cities consisting of Ambon and Tuai. It also consists of nine regencies consisting of Buru, Buru Selatan (South Buru), Kepulauan Aru (Aru Islands), Maluku Barat Daya (Southwest Maluku), Maluku Tengah (Central Maluku), Maluku Tenggara (Southeast Maluku), Maluku Tenggara Barat (West Southeast Maluku), Seram Bagian Barat (Western Seram), and Seram Bagian Timur (Easterm Seram).

Even though the maximum number of positive malaria cases was always recorded in a different month every year, they always occurred in the same climate zone in terms of season. According to Mulyana [(11)], June, July, and August are generally considered as the dry season in Indonesia; September, October, and November are the transition period from the dry to rainy season; December, January, and February are considered as the rainy season; while March, April, and May are the transition period from the rainy to dry season. Based on the data, the highest numbers of malaria cases were recorded during the transition from the rainy to dry season in three different years, while the highest numbers of malaria cases were recorded during the rainy season in two different years.

Malaria is a protozoan infection that is transmitted by mosquitoes, which require moisture for breeding. Malaria, along with other vector-borne infections, is strongly affected by weather variables. In arid areas, the increase of rainfall can be associated with the expansion of the breeding sites of *Anopheles*, the most common malaria vector. Meanwhile, in humid areas, drought can improve breeding conditions for mosquitoes, leading to outbreaks. Natural predators of vectors also determine the vectors' abundance. If the reproductive cycle of predators is longer than that of mosquitoes, the mosquito population could increase before the predators have a chance to control it. Air temperature, rainfall, and vegetation also affect the abundance of food and the behavior of predators [(12)].

Rainfall could increase the transmission of *Anopheles* by promoting the vectors' breeding site or, conversely, it could also eliminate it by flooding the vectors' breeding site [(6)]. This phenomenon is shown by the fact that the maximum numbers of cases from 2015 to 2016 were recorded during the rainy season (December to February). It means that rainfall during the

rainy season could encourage malaria by promoting the breeding site of *Anopheles*.

Besides, ambient temperatures are required for parasite growth within the *Anopheles* mosquito. Optimum temperatures are between 25ºC and 30ºC, hence their abundance in the tropical zones, including Indonesia. Temperature affects the extrinsic or sporogonic stages of the parasite within the mosquito, which means that temperature can affect the transmission rates of malaria [13].

Besides that, in 2012, 2013, and 2014, the maximum numbers of cases were recorded in March, April, and May, respectively, while those months are classified as part of the transition period from the rainy to dry season. This could happen because the breeding site was formed at the end of the rainy season, which is in the end of February, but the transmission and cases would be detected later between March and May.

According to Oktafandi *et al.*(2014), there was a significant difference of the proportion of malaria between males and females in 2011–2013[7]. The study that was conducted by Letelay and Delima (2012) also showed that men had a higher rate of malaria infection at 53.06% than women had at 46.94% [14].

It may be due to the fact that men do more activities outside their home, including at night, so it is reasonable that malaria transmission is more common in men than in women. Based on a study by Bagaray, Umboh, and Kawatu [15], there was a significant relationship between outdoor night activities and malaria infection (OR=3.375: CI 95%: 1.303–8.744). It means that people who have activities outside at night have a 3.375 times higher risk of getting malaria infection than people who do not.

There are more than 400 different species of *Anopheles* mosquitoes, but only 30 are considered as important malaria vectors. Five species of *Plasmodium* can infect human beings, and two of them are *Plasmodium falciparum* and *Plasmodium vivax* which pose the greatest threat [16].

Most major cities in Indonesia are also free of malaria risk, even in otherwise high-risk areas. However, the highest risk is found in eastern Indonesia, especially in the provinces of East Nusa Tenggara, Maluku, and Papua [17]. Although *Plasmodium vivax* causes the highest number of malaria cases in Maluku and can cause severe illness and deaths, *Plasmodium falciparum* is the most dangerous malaria parasite. Furthermore, *Plasmodium falciparum* causes the second highest number of malaria cases after *Plasmodium vivax* in Maluku [16].

The limitation of this study included the time range of malaria cases being investigated. Expansion of the time range can show a more comprehensive and valid trend of malaria in Maluku Province. Other limitations include relatively small number of cases and lack of climate data. Besides those, the climate factor should also be included in order to generate a more thorough picture of the trend in malaria cases in Maluku.

Conclusion

In conclusion, the number of malaria cases in Maluku Province tends to decrease over the past several years. The highest numbers of cases were found during the rainy season (December to February) and the transition period from the rainy to dry season (March to May). The lowest number of cases was found in February. Men had a higher number of malaria infection than women. The highest API of monthly malaria has been found in Maluku Barat Daya Province. The government should be more concerned about the malaria prevention program in Maluku Province. The trend of malaria cases has decreased, but Maluku Province still has the High Level of Incidence (HLI) of malaria in Indonesia. The highest number of malaria cases in Maluku was caused by *Plasmodium vivax*, while the lowest was caused by *Plasmodium ovale.* Some preventive measures to deal with malaria must be introduced to the local communities, so their knowledge about the transmission and elimination of malaria can increase. Health officers can also help disseminate the knowledge by providing information that anyone who wants to do activities outside at night must wear full-length clothes that can protect their body from mosquito bites. Besides that, the local people should also use mosquito repellent lotion to prevent mosquito bites. Thus, the transmission of malaria through mosquitoes can be reduced.

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Conflict of Interest: No conflict of interest in this research.

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Ethical Clearance: No ethical approval for this research because it is used secondary data.

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A Qualitative Study: Perceptions of Premarital Sexual Behavior among Teenage Girls

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Abstract

Background: Youth nowadays are encouraged to do premarital sexual practice like kissing or making out even some of them are okay with free sex. This happens because of assertiveness deficiany among teenanger.

Objective: This qualitative study aims to explore teenage girls' experience in assetiveness toward premarital sexual behavior.

Method: Data were acquired through a thorough interview on eight teenage girls aged from 18 to 21 years old selected with purposive sampling technique. The data were analized with Colaizzi approach.

Results: The themes found related to teenage girls experience on premarital sexual behavior including sexual behavior determinant, reasons on being assertive, the assertiveness, its impact or effect, and obstacle of being assertive.

Conclusion: This study recommends healthy sexual education for teenage girls to prevent premarital sexual behavior by boldly stating the limitation on what to do and not do while in a relationship, by always having healthy communication with parents, by developing religion believes and knowledge, and as well by boldly reject any negative or unhealthy behavior while in a relationship.

Keywords: *Assertiveness, premarital sexual behavior, teenage girls.*

Introduction

Sexual activities are intensified among teenagers as the result of hormonal alteration during puberty. This is in line with youth are encouraged to do premarital sexual practice like kissing or making out even some of them are okay with free sex nowadays. Premarital sexual behavior is a kind of sexual behavior done without official marriage by law as well as religion law or customs[1].

A survey done by National Population and Family Planning Board (BKKBN) on 2009 states that teenagers in Jabotabek (51%), Bandung (54%), Surabaya (47%) and Medan (52%) openly admit having done premarital sexual activities[2]. Data from *United Nations Development and Social Affair* (UNDESA) in 2010 state that Indonesia is in 37th for the country with the highest rate of early marriage and the second highest in ASEAN after Cambodia[3]. The premarital sexual behavior also causes more than six million cases of teen pregnancy annualy, and four million cases of risky abortion among teenagers compounded by half million of teenagers are positively exposed to HIV in Asia-Pacific. This shows the piling up numbers of premarital sexual behavior cases among teenagers which also in line with the negative impact of it.

Reasons behind premarital sexual behavior are 57.5% of boys saying that they are curious while 38% of teenage girls stating that it just happened like that, and 12,6% among them admits that they are being forced to do that[3]. Some behaviors in relationship that can fairly lead to premarital sex such as respondents regularly having conversation (99%), holding hands (82%), hugging (45, 9%), kissing cheecks (47,3%), kissing lips (22%), kissing necks (11%)[1]. The unhealthy teenage

dating are exposed to risky sexual behavior which is shown through 92% of teenagers admitting holding hands, kissing (82%), and petting (63%)[4].

Teenage girls are helpless in rejecting their boyfriends' desire since they are afraid. Moreover, these girls are helpless in defending themselves to not kiss their boyfriends for some reasons, such as"…since we're dating"[5]. Violence in teenage dating happens because victims tend to be powerless or afraid to say "no", tend to isolate or to punish them selves[6]. This can be related to gender issues as males see the powerlessness on females. This corresponds with a study which shows teenage girls usually doubtful in rejecting their boyfriends' desire. They tend to be afraid of hurting their boyfriends' feeling instead of their own emotional responds such as anger or ashamed[5]. This proves on the deficiency of the girls' life skills about healthy life behavior, risky sexual behavior, and assertiveness.

Material and Method

This study is qualitative study with the use of phenomenology-descriptive approach. The strategy used to gather the data is through deep interview. The data are collected from eight participants selected with purposive sampling technique with inclusive criteria such as teenage girsl aged between 18-21 years old who used to have boyfriend or currently dating for at least a month, willing to participate, fully involved for the study, signing the given informed consent,able to tell their experience while dating, and able to speak Bahasa fluently.

The analysis of the data was done through Colaizzi analysis method, including listening to the verbatim record, transcribing, re-reading all transcripts to identify the keywords through statement filter which then can be significant with the studied phenomenon, decoding the meaning of the keywords, arranging the identified meaning into several themes, and integerating the results of the study into one narration.

Funding: There are five themes related to teenage girls' experience on assertiveness toward premarital sexual behavior.

Premarital sexual behavior determinants: Most of pasrticipants have admitted in committing premarital sexual behavior such as holding hand, hugging, and kissing.

"well, it's normal dating stuff, thinking of him and kissing him, are very normal, shame if we didn't do those stuff while we're dating… if we hanging out, we usually holding hands" (P1)

"just like other couples, while I see him, we usually chat, telling stories, but sometimes he can be annoying when he hugs me or touching me, he pretended to accidently touch my boobs…" (P3)

"when we hang out, normally we chat and holding hands, not doing weird stuff" (P2;P3;P4;P6;P8)

Some participants do not commit premarital sexual behavior.

"since we're still in college and my boyfriend is also my classmate, it will be weird if we do anything like that. When we're dating, we just hanging out, talking, in crowd, like classroom or canteen…" (P5)

"I usually see my boyfriends with my friends tagging along, while doing paperwork or having lunch together…" (P7)

Types of premarital sexual behavior by participants such as holding hands, hugging, kissing. That premarital sexual behavior of teenagers is an activity carried out by teenagers while dating starting from talking, holding hands, seducing, flirting, cuddling, kissing, hugging, caressing to having sex[6]. Dating is a phase of two individuals of the opposite sex characterized by mutual personal recognition of both the weaknesses and strengths of each individual. There are two types of dating, namely healthy and unhealthy dating. Healthy relationship while dating covers physical, psychological and social aspects. Unhealthy dating includes kissing, petting and sexual intercourse[7].

Premarital sexual behavior in teenage dating is a manifestation of sexual desire that is manifested starting from glancing towards the sensual part of the partner to intercourse performed by teenagers who are dating. Dating behavior, especially students or late adolescents (18-24 years old) currently leads to negative dating behavior or very complex sexual behavior. Sexual activity as if it has become a common thing done by teenagers in relationship[8]. The existence of sexual urges and feelings of love make teenagers want to always be close and make physical contact with their partners. Physical closeness and physical contact occuring between adolescents who are on the ground will be

different from physical proximity or physical contact between teenagers and friends and family. This physical closeness will ultimately lead to sexual behavior in teenage dating[9].

The reasons of assertiveness toward premarital sexual behavior: Almost all of participants understand on the importance of being assertive toward premarital sexual behavior as such behavior is condemned by religion as well as among their parents.

"my parents always told me, even when I was a little, to always be careful when befriend someone as well as dating like when we're together on a date, my parents told me to not get too closed to avoid any unfortunate stuff, my Koran teacher as well said the same stuff, as the devil will seduce us to do anything sinful. (P6)

"my parents always told me, to always be careful, if I hang out with a boy, I shouldn't be touched by him as he would ask for more. You know boys if we allow him to touch us, he will ask for more, so I have to be careful…" (P2;P3;P5)

"dating is prohibited by religion, it is unacceptable and sinful…" (P5;P7;P8)

The reason of assertiveness shown on teenage girls toward premarital sexual behavior is because it is prohibited by religion and parents. There are many things that make teenagers have to limit sexual activity during dating, such as family norms, religion and social custom which are signs that must be adhered to by teenagers who are dating[9]. Social prohibitions and restrictions from attaining religious rituals have created a negative impact on adolescents and have blocked the access to the right kind of information[10].

The assertive behavior toward premarital sexual behavior: Almost all participants are assertive in effort to prevent premarital sexual behavior, either through physical reaction or verbal reaction by expressing anger and fending off hand.

"if my boyfriend begun to make a move, like embracing or caressing and squeezing, I just have to fend his hand off.." (P3)

"Well, I just snapped out if my boyfriend touched me like that, I will yell him big time, he will shut off eventually and go" (P2)

"if he tried to touch me, I will be very furious at him. We have an agreement before about touching, so it is justifiable if I yell at him "(P6)l.

Participants are assertive in making efforts to avoid premarital sexual behavior both physical endeavors such as hitting and verbally ie angry or cursing. Assertive behavior is the ability of individuals to express positive or negative feelings and thoughts in a firm and free manner while still paying attention to the feelings of others. Individuals are more likely to be assertive to people when individuals feel confident and have a positive attitude towards themselves and others. Assertive behavior is used to direct individuals to remain consistent and not easily affected by an unfavorable environment, given the many problems faced by adolescents. A person who is assertive directly and clearly expresses his positive and negative feelings without disturbing or violating the feelings and freedoms of others[2].

Assertive teens are better able to say "no" to things that are negative and unwanted, able to submit requests, able to start, continue, and end public conversations. Teenagers are more able to express their emotions properly without having to be aggressive or permissive. Adolescents who are assertive are able to communicate with everyone openly, directly, honestly, and properly, have an active view of life, have efforts to get what they want, are able to express their feelings and thoughts, are able to give and receive praise and can accepting his limitations[11]. This is closely related to adolescent assertive behavior towards the opposite sex. Communication that runs less effectively often occurs in interpersonal relationships because individuals are less able to express thoughts, feelings, and desires honestly and openly. Individuals show helplessness, passivity, violated personal rights, and inability to say "no" about something that is contrary to conscience.

The impact of assertiveness toward premarital sexual behavior: Some participants recognize the impact of assertiveness toward premarital sexual behavior in teenage dating, namely breaking up, huge fight and forceful action.

"My boyfriend were offended by my action, then he got very angry while saying harsh things to me, he insisted, and grabbed my hand, I fended it off again, as he was very annoyed with me, we finally broke up..." (P3)

"He couldn't get over it, he turned back and said things to me, said I was pretentious, hypocrite, and so on... then he left me ... we broke up..." (P2)

"My boyfriend couldn't face the fact that didn't want to be touched, until finally he pulled me and forced me, until I fell ... I was really upset, and finally I got angry ... we broke up (P4)

Assertiveness of premarital sexual behavior is the ability of a person to be firm in defending his sexual rights to not be harassed and can make sexual decisions while still giving respect to the rights of others and without hurting others or their partners, and expressing themselves honestly in ways that right without disturbing anxiety so as to encourage the realization of parallels and similarities in relations with their partners[11]. The reality in society shows that there are still many individuals who are not assertive in rejecting the invitation to conduct premarital sexual behavior. This makes individuals vulnerable to sexual harassment, which is generally caused because individuals do not dare to reject the invitation to have sexual relations by their partners. Such individuals lack assertive abilities in sexual behavior[2].

As a result of being assertive in an effort to avoid premarital sexual behavior in courtship, namely breaking up, harsh words and coercion. Teenagers should not only see the momentary impact that they will receive as a result of rejecting premarital sexual behavior in courtship as decided by their boyfriend, but must think about the great risks they will experience if they have pre-marital sexual relations in courtship. Young women who are able to refuse premarital sexual behavior aim to avoid things that are not desirable[11]. There is a relationship between assertiveness and the tendency to be victims of dating violence in adolescents, namely the higher the assertiveness, the lower the tendency to become victims of dating violence, and vice versa[12].

The obstacles of assertiveness toward premarital sexual behavior: Almost all participants recognize the obstacles in being assertive toward premarital sexual behavior, which is difficult to convey their attitude.

"it's the difficulties of having a relationship, sometimes I couldn't think the way to refuse it, if he startedto touch my hands, I was afraid, if I refuse, he would be mad, while if he continue it, I was afraid if he's gonna do something else wrong,so I didn't know what to do." (P2)

"I didn't know how to be honest to him, I didn't know how, I was afraid he's going to be mad" (P6)

"It's hard for me to control my emotion... if I was upset, I impusively hit him right away ..." (P3)

Obstacles in being assertive about premarital sexual behavior are difficult in conveying his attitude.Teenagers are eager to forbid their partners to touch sensitive parts of the body but they are afraid of losing their partners[8]. Adolescents do not dare to reject their partner's wishes for fear that their partner will get angry with him. In addition, girls cannot maintain their desire not to kiss their girlfriends for the reason stated by their girlfriend, namely "the same time their boyfriend doesn't want to"[5]. Research conducted by The occurrence of violence in dating because victims tend not to dare to reject or say "no", close themselves and punish themselves[6]. Adolescent's pattern of thinking revolves around the fact that they are invincible and invulnerable[13].

Conclusion

Premarital sex behavior carried out by teenagers such as holding hands, hugging, kissing is considered a reasonable dating behavior among teenagers. Dating is used as a way of approaching between individuals of the opposite sex, which is characterized by knowing each other both the strengths and weaknesses of each. Experience of young womenin being assertive by limiting sexual activity during dating keeping in mind family, religious and community norms that become signs that must be obeyed. Adolescents who are able to be assertive are better able to say "no" to things that are negative and undesirable, able to submit requests, able to start, continue, and end a general conversation to reject pre-marital sexual behavior. Increasing the ability of adolescents to be assertive about premarital sexual behavior can be done through health education efforts.

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Hazard and Risk Analysis by Implementing Hiradc Method in the Laboratory of Medical-Surgical at Faculty of Nursing Universitas Airlangga

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Abstract

Risk management is a system owned by all industrial sectors, including the industry in the educational sector, such as a university laboratory. Amongst the method of risk management that are usually applied is HIRADC method, which is a systematic stage to assess hazards, to analyze risks, and to devise controls according to the existed risks. This research is descriptive research which aims to describe the dwelled phenomena. There are several stages in this method, namely hazard identification, risk analysis, and risk control. The data is gathered by conducting observation before doing data matching with Mr. Achmad Tarmidzi, the Laboratory of Medical-Surgical's worker. The research results indicate that from two activities performed in the Laboratory of Medical-Surgical at Faculty of Nursing Universitas Airlangga, such as injection practicum and wound care practicum, there are six hazards discovered, namely medicine in ampoule packaging, needle stick, alcohol, NaCl 0.9% solution, and Chlorine 0.5% solution. The risks ascertained are skin and eyes irritation caused by the exposure of chemical substances like alcohol, NaCl 0.9% solution, and Chlorine 0.5% solution. Other than that, the risks found belong to the categories of the low-risk level and moderate-risk level. The controls and recommendations provided are the conveyance of socialization regarding the practicum in accordance with the SOP, the wearing of PPE, such as rubber gloves, goggles, and long-sleeved shirts.

Keywords: *Risk assessment, HIRADC, laboratory.*

Introduction

The rapid growth of civilization has been associated with various growth in technological sectors. One sector that is benefited by the development of technology is the educational sector. On the other hand, the development of technology can also have bad impacts. According to the book authored by Ramli (2010) entitled "*Pedoman Praktis Manajemen Risikodalam Perspektif K3*", accidents are most likely caused by the contacts between human and machine[1].

Referring to ILO (International Labour Organization), the number of occupational accidents have reached approximately two million per year, which is caused by accidents, injuries, and occupational illnesses. If compared, the number is equivalent to accidents experienced by 5,000 workers per day or 3 workers per minute. Other than that, ILO also declared that at least there are 2.78 death cases every year with 380,000 among it are occupational accidents[2].

Risk management is a system that must be owned by a company, providing risk management itself is meant to protect a company from all things that can cause losses. The risk in the field of Occupational Safety and Health in a company usually focuses on negative risks, such as injuries, property damages, or operating disruption. Denoting to OHSAS 45001, risk can be explained as the likelihood of adverse events and its severity caused by the events. Meanwhile, risk managementas cited from AS/NZS 4360, is a system, process, and culture which directly focus on the effectiveness of the management system to reduce the exposure and the consequences that may follow[1].

HIRADC (Hazard Identification, Risk Assessment, Determining Control) in ISO 45001 is interpreted as a procedure of planning, in which a company needs to perform several stages of activity, namely hazard identification, risk assessment, and determining control[3].

1. Hazard identification is a process of identifying and distinguishing dangers and hazards in a working environment. The hazards can be in forms of physical, chemical, biological, psychosocial, or ergonomic/physiological hazards and also be caused by the workers, which also known as at-risk behavior.

2. Risk assessment as referred from ISO 45001:2018 is an activity to assess the degree of the risk from dangers and hazards that have been identified as well as to review the effectiveness of the existent control program.. After passing through the stage, the results of the likelihood and severity will be inputted to risk matrix to figure out the level of each risk.

Table 1. Qualitative Measures of Likelihood by AS/ NZS-4360: 1999

Level	Description	Explanation
5	Almost certain	Expected to occur in most circumstances
4	Likely	Will probably occur in most circumstances
3	Possible	Might occur at some time
2	Unlikely	Could occur at some time
1	Rare	May occur only in exceptional circumstances

Table 2. Qualitative Measures of Consequences by AS/NZS-4360: 1999

Level	Descriptor	Example detail
1	Insignificant	No injuries, low financial loss
2	Minor	First aid treatment, on-site release immediate contained, medium financial loss
3	Moderate	Medical treatment required, on-site release contained with outside assistance, high financial loss
4	Major	Extensive injuries, loss of production capability, off-site release with no detrimental effects, major financial loss
5	Catastrophic	Death, toxic release off-site with detrimental effect, huge financial loss

Table 3. Qualitative risk-matrix Level of Risk

Likelihood	Consequence				
	1	2	3	4	5
A (Almost certain)	H	H	E	E	E
B (Likely)	M	H	H	E	E
C (Possible)	L	M	H	E	E
D (Unlikely)	L	M	M	H	E
E (Rare)	L	L	M	H	H

Explanation:

Extreme : extreme risk, immediate action required

High : high risk, senior management attention needed

Moderate : moderate risk, management responsibility must be specified

Low : low risk, manage by routine procedures

3. Determining control is an endeavor or a program that is intentionally made to lessen losses or severity that may arise. An organization to make changes and controls need hazard identification and risk assessment to notice the severity level of hazards that are likely to occur.

Table 4. Hierarchy of Risk Control (Hierarchy of Controls ANSI ZIO)

Hierarchy of Controls		
Elimination	**Eliminating potential hazards**	Make the workplace safe for workers
Substitution	Substituting equipment/ machine that is no longer suitable for use	
Engineering	Modifying by designing machine/equipment or workplace to become safer	
Administrative	Procuring posters, workshops, OSH regulations, working hours, etc.	Secure workers from exposure
Personal Protective Equipment (PPE)	Providing equipment that can lessen the risk of the occurrence of accidents or occupational illnesses	

Material and Method

This research is descriptive research, which is aimed to depict a phenomenon. The method of risk analysis applied in this research is HIRADC method in accordance with ISO 45001:2018. Conferring the method, there are several steps mentioned, namely hazard identification, risk assessment, and determining

control. The data in this research is qualitative data in form of description, words, or behavior that were observed. By referring to the classification of qualitative data by Patton in Ivanovich (2003), the data used in this research is in form of observation result[4].

In addition, hazard identification was also completed by observation by the researchers. After that, the researchers counted the risk assessment score and matched it with the Likelihood and Severity level and then matching and checking it with the laboratory worker, Mr. Achmad Tarmidzi. Thereafter, after completing risk analysis with the laboratory worker, the researchers planned control activity to reduce the risks that are likely to occur.

Findings:

Hazard Identifications: Hazard identification itself is determined based on the type of hazard. The Laboratory of Medical-Surgicalcontains two main activities, such as injection practicum (intravenous, intramuscular, intracutaneous, and subcutaneous) and wound care practicum.In fact, the hazard identification process is not only performed to hazards that can be controlled, but also to those outside the organization. Risk identification itself has several intentions, one of those is to enlist the risks that can be used as a reference of the process to strengthen, prevent, fasten the process, and many more[5].

Injection Practicum: It is noticed that there are several injection practicums, namely intravenous injection, intramuscular injection, intracutaneous injection, and subcutaneous injection. Intravenous injection is a kind of injection to deliver liquid substances, especially antibiotics, through the bloodstream system directly to a vein. It is usually done when giving infuse liquid to the patient through arm folds, leg, neck, and head. Meanwhile, intramuscular injection is one of the ways to deliver medicine in form of vitamin, vaccine, antibiotic, and antipyretic. On the other hand, intracutaneous injectionis a kind of injection by delivering medicine to the epidermis, resulting in skin induration, such as thickening and hardening of the skin that is visible to the eyes. Additionally, intracutaneous injectionis often given during the skin test, tuberculin test, or *Mantoux* test. Lastly, subcutaneous injection is perceived as delivering liquid medicine into the layer of fat under the skin by using a syringe. The types of medicine delivered are insulin and local anesthesia[6]

The injection practicum is noticed to be containing several hazards, which can be classified to physical and chemical hazards. The physical hazards that can be found are ampoule glass packaging medicine that can result inthe exposure of broken glass when opening the packaging and the syringe that can cause fingers punctured by the needle stick. Meanwhile, the chemical hazard discovered in this activity is the use of alcohol as disinfectant or sterilizer of practicum equipment that can trigger skin and eyes irritation if exposed to the chemical substance.

According to the article entitled "*Dermatitis Kontakpada Tangan Perawat Rumah Sakit: Kasus Seri*" authored by Ariwibowo (2013), it was affirmed that the type of alcohol that is commonly used by medical personnel is benzyl alcohol 1%, which functions as disinfectant and preservatives for injection materials and the installation of new tissues. On the other hand, primary alcohol, such as ethanol and methanol, can generate skin conditions, for examples, dry skin, irritation, and the increase of skin sensitivity. Additionally, benzyl alcohol has been observed to remove water and lipid from the epidermis that is believed to malfunction the epidermis barrier[7].

Moreover, there is a physical hazard, namely punctured by needle stick. This can be said so providing unsterile needle stick is one of the media to spread nosocomial infection and injury.

Wound Care Practicum: Wound care practicum is conducted to comprehend the mechanism and procedures for selecting wound dressing as well as the difference of caring between the moist wound and dry wound. The physical hazard found is the presence of scissors that can cause injury if not used properly during the practicum. In the meantime, the chemical hazard discovered is the presence of chemical substances, such as NaCl 0.9% solution, alcohol 70%, and chlorine 0.5% solution.

The selection of wound dressing is prominent in the process of wound healing. Furthermore, wound healing is also beneficial to fasten the cell replacement process to make new tissue and to prevent microorganism from entering the wound. This because the wound is one of the open doors for bacteria, virus, and other organisms that can cause infection[8].

Alcohol is a chemical substance that is most used in the field of health. Generally, alcohol is colorless and odorless liquid. Referring to the grade arranged by NFPA,

alcohol belongs to level 3 of the severity level and its impact on health. Besides causing skin irritation, alcohol 70% can also cause eyes irritation if directly exposed to it. Acute eyes irritation can be severe conjunctiva membrane irritation, cornea myopia, redness, pain, runny, and blurred vision. As for the long-term irritation or chronic, alcohol 70% can cause conjunctivitis[9].

Chlorine 0.5% solution is a greenish yellow gas with irritant characteristics that are likely to cause acute damage on the upper and lower respiratory tract. The consequences that often arise due to the exposure of chlorine are eyes and respiratory tract irritations, and in several cases, chlorine can also result in death. In the acute symptoms, chlorine gas poisoning on the eyes can cause eyes pains which eventually cause tears due to the inflammation of the conjunctiva. It may take quite some time for the onset of chronic symptoms, yet chlorine gas poisoning can cause eye burns[10].

The damage of respiratory tract caused by chlorine gas, such as mucosae membrane irritation, can manifest to become respiratory tract disorder. There are many complaints regarding the disorder, namely rhinorrhoea, persistent severe cough, shortness of breath, out of breath, and the feeling of being suffocated. This happens due to the fact that chlorine has an oxidizer characteristic by releasing oxygen nascent that can form hydrochloric acid. Later, this can lead to nose mucosae, pharynx, larynx, and trachea inflammations. In severe cases, this can trigger *laryngotracheobronchitis* or the presence of blood in the respiratory tract[10].

Risk Analysis: The risk analysis performed present suggestions for the evaluation stage, which later will be considered by the company to decide what treatment to do to the risk sources[5]. In this stage, the assessment by giving scores to hazard ratings is needed. The scores given are measured by observing the Likelihood, or the possibility of the risk occurrence, and the Severity, or the consequences of the risks.

Table 5. Risk Analysis and Risk Level

No.	Activity		Risk	Risk Analysis		Total Risk	Risk Level
				L	S		
1.	Injection practicum (intravenous, intramuscular, intracutaneous, and subcutaneous)	Ampoule glass packaged-medicine	Scratched by the glass when opening the ampoule	2	2	4	Low
		Syringe	Wounds caused by the syringe	3	2	6	Moderate
		Alcohol	Skin and eyes irritation caused by the exposure of alcohol	1	2	2	Low
2.	Wound care practicum	Scissors	Wounds caused by the sharp edge of the scissors	2	2	4	Low
		NaCl 0.9% solution (PZ)	Skin irritation caused by the exposure of chemical substances	1	2	2	Low
			Eyes irritation caused by the exposure of chemical substances	2	2	4	Low
		Alcohol 70%	Skin and eyes irritation caused by the exposure of chemical substances	1	2	2	Low
		Chlorine 0.5% solution	Skin irritation caused by the exposure of chemical substances	2	2	4	Low
			Eyes irritation caused by the exposure of chemical substances	2	2	4	Low
			Respiratory tract irritation caused by healing the steam of chemical substances	2	2	4	Low
			Skin burns caused by the exposure of chemical substances	2	3	6	Moderate

The counting and the categorization of the scores referred to the tables proposed by AS/NZS 4360-19999. It is noticed that the risks discovered belong only to two levels: moderate and low. This is caused by the low frequency of risk occurrence in the laboratory with not too detrimental impacts.

Determining Control: In this stage, the hazards and risks that have been identified are analyzed to formulate the control strategies based on each risk category. The determining control used in this research refers to the one avowed by ANSI ZIO, which consists of elimination, substitution, engineering manipulation, administrative and PPE. Determining control can also be categorized based on the level of each risk.

Table 6. Risk Level Classification

Risk Level	Follow-up	Score
Low-risk (L)	Additional control is not needed. What to be noticed is less-costly way out and the improvement that does not require a large additional cost. Monitoring is required to ensure that the control is preserved and implemented properly.	1-4
Moderate-risk (M)	Actions to decrease risks are obligatory, however, the prevention costs need to be well-calculated and limited. Risk reduction measurement needs to be implemented properly.	5-9
High-risk (H)	The works have been done until the risks are reduced. The resources allocated to reduce risks need to be considered. If the risk is found during the work, the control needs to be immediately executed.	10-16
Extreme Risk (E)	The work is not done nor continued until the risks have been reduced. If reducing risks with limited resources is impossible, then the works cannot be continued.	20-25

This research revealed that from two activities, six hazards are found, namely ampoule packaged-medicine, needle stick or syringe, alcohol, NaCl 0.9% solution, and Chlorine 0.5% solution. From those six hazards, only two hazards that belong to moderate-risk level, for instance, the risk of being punctured with needle stick or syringe and skin burns caused by the exposure of Chlorine 0.5% solution when conducting a practicum.

In accordance with control hierarchy, several controls that need to be carried out to decrease the occurrence of occupational accidents are the conveyance of manuals on the procedures and rules during every practicum, the carrying out of practicum as procedure, the wearing of Personal Protective Equipment, such as rubber gloves to prevent skin irritation due to the exposure of chemical substances and long-sleeved shirt to lessen the risk of skin burns caused by the exposure of chlorine.

Conclusions

Based on the research that has been done, can be concluded that at Laboratory of Medical – Surgical has a low-risk potential. It can bee see that from 11 risks potential only 2 from them that has a moderate-risk. Meanwhile, they has been introduced to using a PPE but many of them don't wear one such as rubber gloves or long sleeve shirts that can prevent the contact from hazard to the skin.

Denoting the research and observation that have been carried out, the recommendations that can be provided are the conveyance of socialization concerning on the SOP (Standard Operating Procedure) to the academicians who are likely to involve in the practicum activities, including laboratory workers, students, lecturers, and cleaning services.

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Conflicts of Interest: None

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A Three-Years Survival Rates of Chronic Myeloid Leukemia Patients with Targeted Therapy

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Abstract

Introduction: Chronic myeloid leukemia (CML) is a hematopoietic stem cell cancer driven by the BCR-ABL fusion protein that arises from the translocation of chromosomes 9 and 22. Since the found of the Tyrosine Kinase Inhibitor (TKI) as a targeted therapy, the relative survival rate of 5 years has significantly increased compared to the era of the use of previous agents. As a successful leukemia treatment, it can be seen based on the survival rate. Several factors have been known to influence the survival and prognosis of CML patients, including the age of the patient at diagnosis, gender, and response to therapy and treatment. This study aims to determine how many a three-year survival rates for CML patients with targeted therapy in Makassar and the factors that affect survival.

Method: This study used a retrospective cohort using secondary data (medical records) of CML subjects who had been outpatient or inpatient followed in the same time period. The study was conducted in January 2015 to December 2017 at Dr. Wahidin Sudirohusodo Hospital, Makassar. The samples consisted of 108 subjects who met the inclusion criteria. Gender, age, BCR-ABL transcript, targeted therapy and status were taken from medical records. Data were analyzed with SPSS 22.0 version and survival analysis, Meier Kapplan curves, survival median, log-rank and test statistic

Results: There were 108 subjects of CML patients who received targeted therapy, 58 male (53.7%), 30-39 years old 32 subjects (29.6%), b3a2 transcript 67 subjects (73.6%), Imanitib 62 subjects (57.4%) and status for 36 months was followed during the targeted treatment of dead 19 subjects (17.6%) and alive 89 (82.4%). The survival rate of a three years CML subjects who received targeted therapy of 51%, found no significant relationship between gender, age, and targeted therapy

Conclusion: The survival rate of three years of CML patients at Wahidin Sudirohusodo Makassar Hospital is 51% and factors related to age, gender, and targeted therapy tend to influence even though statistically not significant

Keywords: *Three-year survival, CML, targeted therapy.*

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Introduction

Chronic myeloid leukemia (CML) is a hematopoietic stem cell cancer driven by the BCR-ABL fusion protein that arises from the translocation of chromosomes 9 and 22.(1) The conjugation of the breakpoint cluster region (Bcr) gene on chromosome 22 and the Abelson kinase (Abl) gene on chromosome 9 creates the Bcr-Abl oncogene, which encodes the deregulation of tyrosine

kinase. Bcr-Abl activity will create uncontrolled cell proliferation and reduce apoptosis, thereby it will increase malignant expansion of pluripotent stem cells in the bone marrow.[2,3]

Data on CML in Indonesia in 2018 obtained as many as 2,374 patients, most in Surabaya as many as 516, while at least, in Banda Aceh as many as 40, and in Makassar as many as 110. The median age for CML event is 45-55 years old and the event will increase with age.[4]

By recognizing the molecular basis of CML, a highly effective targeted therapy has been developed. This therapeutic agent will block the activity of the tyrosine kinase inhibitor (TKI) of Bcr-Abl in which will inhibit the course of the CML molecular process. Since the found of the Tyrosine Kinase Inhibitor (TKI), the relative survival rate of 5 years is much increased compared to the era of the use of the previous agent. The first generation of Tyrosine Kinase Inhibitor, Imatinib Mesylate was proven to provide excellent clinical outcomes. In Indonesia, the use of TKI has been applied to CML patients and has reached the use of the second generation namely Nilotinib (Tasigna). The comparison of the survival of the two target therapy was reported in the ENESTnd study (Evaluating Nilotinib Efficacy and Safety in Clinical Trial-Newly Diagnosed Patients) where from the 5-year follow-up of patients with nilotinib 300 mg of 93.7%; nilotinib 400 mg by 96.2% and Imatinib 400 mg by 91.7% did not show a significant difference between the two. However there were differences in death due to progression from CML, namely 16 Imatinib death 93.8% while 6 Nilotinib death 97.7%.[5] The survival of CML patients with imatinib in 2006 reported by Drukker, et al. stated an overall survival of 89% after five years.[6]

As a successful leukemia treatment, it can be seen based on the survival rate.. In leukemia patients, using a five year survival rate. This was study carried out for three years as in the second or third year the patient level of compliance sometimes begins to decrease because they felt healed. Several factors that have been known to affect the survival and prognosis of CML patients include the patient's age at diagnosis, gender, and response to therapy and treatment. Now days there is no data of survival rates of CML with targeted therapy in Makassar, therefore we are conducting this research.

Method

This study used a retrospective cohort using secondary data (medical records) of CML subjects who had been outpatient or inpatient followed in the same time period. The study was conducted in January 2015 to December 2017 at Dr. Wahidin Sudirohusodo Hospital in Makassar. Samples were CML patients who met the inclusion criteria included (1) CML patients based on BMP (2) positive BCR-Abl (3) age ≥ 18 years (4) willing to join the study. Exclusion criteria (1) Patient cannot be contacted either by telephone (2) Incomplete data. The minimum number needed is 61 research subjects. Sampling was carried out consecutively during the study period until the desired number of samples was reached. Furthermore, Data were analyzed with SPSS 22.0 version and survival analysis, Meier Kapplan curves, survival median, log-rank and test statistic.

Results

From this research, subject studied was 108 CML patients with target therapy, consisted of 58 male (53.7%) and 50 female (46.3%). Age of the subjects were 30-39 years is 32 (29.6%). Bcr-abl transcripts of the subjects is b3a2 with 67 subjects (73.6%), 22 subjects (24.2%) b2a2, and 1 subject (1.1%) c3a2 and e1a3 respectively. Subjects receiving targeted therapy were imatinib 62 subjects (57.4%) and nilotinib 46 subjects (42.6%). The last status during the administration of target therapy is dead 19 subjects (17.6%) and alive 89 (82.4%). It can be seen in table 1.

Table 1. Distribution of Sample Characteristic (n=108)

Variable		n	%
Gender	Male	58	53,7
	Female	50	46,3
Age	<30 years	24	22,2
	30-39 years	32	29,6
	40-49 years	26	24,1
	50-59 years	16	14,8
	>=60 years	10	9,3
BCR-ABL Transcript	b2a2	22	24,2
	b3a2	67	73,6
	c3a2	1	1,1
	e1a3	1	1,1
Targeted therapy	Imatinib	62	57,4
	Nilotinib	46	42,6
Status	Dead	19	17,6
	Alive	89	82,4

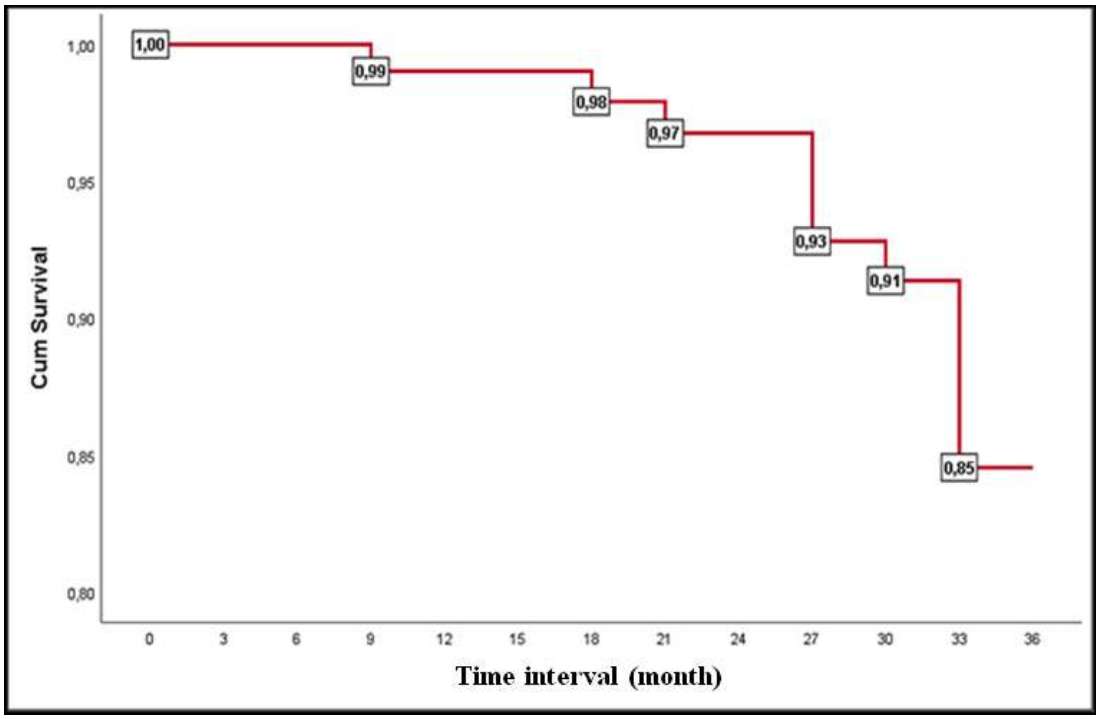

Figure 1. Kaplan-meier Curves of Three-year Survival Probability

Three-year survival rate for CML patients with targeted therapy, an analysis using the life table-Wilcoxon (Gehan) method was obtained, and a one-year survival rate (99%), a two-year survival rate (93%) and a three-year survival rate (51%) (table 2).

Table 2. A Three-Year Survival Analysis of CML Patients

Time interval (month)	n	Survival (%)
0	108	100
3	108	100
6	106	99
9	98	99
12	91	99
15	89	98
18	88	97
21	81	97
24	77	93
27	67	91
30	61	85
33	42	85
36	32	51

Figure 1 shows the probability of survival at each 3-month interval in the Kaplan-Meier curve. The duration of follow-up of all patients is from 5 to 102 months with a mean of 30.4±16.3 months.

Table 3. Three Years Survival of CML Patients by gender

Gender	n	Survival Estimation		p
		Mean (Month)	%	
Male	58	34,6	43	0,856
Female	50	34,2	57	

Table 3 shows that survival in female is higher than in male, which is 57% and 43% (34.2-34.6 month), but statistically not significant (p> 0.05).

Table 4. Three Years Survival of CML Patients by Age

Age (Years Old)	n	Survival Estimation		p
		Mean (Month)	%	
<30	24	34,5	73	0,631
30-39	32	34,9	64	
40-49	26	34,4	54	
50-59	16	34,1	37	
>=60	10	33,8	29	

Table 4 also shows a decrease with increasing age, but not statistically significant (p> 0.05). The highest survival occurred at age <30 years (73%) and the lowest was at age > = 60 years (29%).

In general, survival in the two treatment targets was not found to be statistically significant difference (p> 0.05) (table 5).

Table 5. Three Years Survival of CML Patients by Targeted Therapy

Targeted therapy	n	Survival Estimation		p
		Mean (Month)	%	
Imatinib	62	34,3	52	0,849
Nilotinib	46	34,7	47	

Table 5 also show imatinib gives the highest survival rate (52%) compared to nilotinib (47%). The mean survival rate is also not much different, namely 34.3-34.7 months.

Discussion

This study found that the subjects studied was 108 CML subjects. Most of the subjects were male: 58 (53.7%) and 50 female (46.3%). This result is in line with research conducted by Reksodiputro et. al. in 2011 in Jakarta, where 19 reported samples were studied, slightly dominant in males than females at 63.2%.[7] Several overseas studies conducted by Hofmann in 2015 reported that CML patients were more frequent in male than female.[8] Research was also supported by SEER (Surveillance, Epidemiology, and End Results) USA which stated that of all race, the ratio of male and female from CML is 2.2:1.3.[9]

Age range between 18-72 years old with an average of 39.8±13.1 years old. Research conducted by Reksodiputro et. al. in 2011 where the age of CML patients was in the age range of 13-62 years.[7] It is different from American Cancer Society data that CML cases in the United States in 2019, the average age at diagnosis of CML is around 64 years. Nearly half of the cases are diagnosed in people aged 65 and older.[10]

The duration of follow-up of all patients is from 5 to 102 months with a mean of 30.4±16.3 months. In this study, a one-year survival rate of 99%, a two-year survival rate of 93% and a three-year survival rate of 51% (table 2 and figure 1). This study carried out for three years because, in the second and third years, the patient level of adherence in treatment slowly decreased, where patients sometimes seemed to have felt healed with the disease they experienced. In a study conducted by Di Felice et. al. in 2018 in Italy, 357 subjects reported having CML after being given TKI, survivability for one year (from 83.3, 95% CI 76.2-88.5% to 91%, 95% CI 86.5-94.4%) and survival for three years (from 60.4, 95% CI 51.7- 68% to 84.5%, 95% CI 79-89%).[11]

Survival rate for female was higher at 57% and for male 43%, with a mean survival rate at 34.2-34.6 months. But it did statistically not significant (p> 0.05) (table 3). Research by Berger et. al. in 2005 in Germany reported 856 subjects with Ph/BCR-ABL-positive CML in a randomized CML study, where the survival rate was average longer in female sufferers than in male with an average of 59-49 months and this also not significance.[12]

It is well known that age is a very important prognostic marker, and old age has several times been associated with poor survival. In this study, survival analysis according to age was found to be highest at age <30 years old (73%) and lowest at age> = 60 years old (29%).The decrease occurred with increasing age, but it was not statistically significant (p> 0.05) (table 4). Research by Castagnetti F et. al. in 2017 in Italy reported 337 CML patients, obtained OS was not affected by age in the interval between 18-69 years old (OS 5 years 92%, average from 89% to 95% in different decades), but the probability of OS 5 years for old age (≥ 80 years) was significantly lower (34%, P <0.0001).[13] Research by Di Felice et. al. in 2018 in Italy, reported survival by age was relatively decreased, age <65 years old (from 69%, 95% CI 55.3-79.5% to 94%, 95% CI 88.4-97.4%), age 65-74 years old (from 46%, 95% CI 30.8 -61.2% to 69%, 95% CI 52.5-80.4%) and age> 74 years old (from 8.05%, 95% CI 0.8-26.7% to 51, 2%, 95% CI 32.4-67.1%).[11] It can be assumed that relatively older ages have poor survival.

In general, the survival the Imatinib and Nilotinib, was not found to be statistically significant (p> 0.05). Imatinib highest survival rate (52%) compared to nilotinib (47%) with the mean survival rate also not much different, ie 34.3-34.7 months (table 5). The Food and Drug Administration (FDA) approved imatinib as the first-line treatment for newly diagnosed CML in December 2002 after the International Randomized Study (IRIS), which began in June 2000, the results of this study show the effectiveness of imatinib and its remarkable superiority with respect to complete haematological response rates (CHR), molekuler and complete cytogenetic responses

(MCyR, CCyR) with an overall survival rate (OS) of 85% for patients receiving imatinib.[13] This is different from the ENESTnd study by Larson et. al. (2012) in the United States, which examined 868 subjects comparing nilotinib (300 mg and 400 mg doses respectively) with imatinib, estimated that the three-year survival rate was higher in nilotinib with imatinib is nilotinib 300 mg 95.1%, nilotinib 400 mg 97.0% and 94.0% for imatinib.[14] While another study by Sanglio et. al. (2010) in Australia also found that nilotinib at a dose of 300 mg or 400 mg twice daily was better than imatinib in CML patients with newly diagnosed positive Philadelphia chromosomes.[15] According to Au WY et. al. (2009), In general, Asian patients, the use of imatinib is still used as the first choice therapy for treating CML patients. Either from Asia, Europe or the United States for giving imatinib is generally giving a good response. Most health practitioners in Asia follow the guidelines found on ELN (European Leukemia Net) or NCCN (National Comprehensive Cancer Network). Based on the results of studies that have been collected regarding the response of CML patients to imatinib, in Europe and the United States shows a complete hematological response of more than 95%, while in Thailand, Philippines, India, China, Hong Kong and South Korea by 90-100%.[16]

This study carried out no dose distribution of nilotinib or imatinib and no further examination of the molecular response achieved which should be examined every year after administration of target therapy so that the results found were inadequate. Besides, various factors influencing the survival of the comparison between the two target therapy are not evaluated precisely such as adherence to take medication or how to take medication, cause of death and the presence or absence of a previous comorbid patient history.

Conclusion

Survival rate of three years of CML patients at Wahidin Sudirohusodo Hospital in Makassar was 51% and factors related to age, gender, and target therapy tended to influence even though it was not statistically significant.

Conflict of Interest: No Potential conflict of interest relevant to be declared.

Fund: All funds in this study were covered by personal fund of the authors.

Ethics Committee: It has been approved by the ethical committee of Hasanuddin University Faculty of Medicine with reference number: 429/UN4.6.4.5.31/ PP36-KOMETIK/2019.

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The Effect of Alkaloid Extract of Teucrium Polium L. Against Some Pathogenic Bacteria of Urinary Tracts and on Pyelonephritis Induced in Rats

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Abstract

Objective: In view of the reported literature, the medicinal reputation of *T. polium* plant stills the researcher's attention. This study was conducted to evaluate the antibacterial effect of the alkaloid extract of aerial parts of *Teucrium polium L.* on some pathogenic bacteria and to evaluate the effect of the alkaloid extract in the treatment of induced pyelonephritis in rats.

Method: The aerial parts of *Teucrium polium* was powdered, extracted with ethanol, filtered, and dried. Antibacterial activity of alkaloid extract (250 mg/mL) was evaluated by agar diffusion method. 24 female rats became pyelonephritis by intraperitoneal injection of *Escherichia coli*. The animals were divided randomly into four groups. The experimental patients groups received this alkaloid extract and antibiotic gentamycin freely for 10 days but the control group received tap water. Biochemical parameters such as urea and creatinine (CRT) were measured by kinetic (Enzymatic) and colorimetric method

Results: Our results showed that antibacterial of alkaloid extract gave inhibitory efficacy against the studied bacteria. The results also showed that alkaloid extract can decrease serum urea and creatinine significantly ($P<0.05$, $P<0.001$ respectively).

Conclusion: Alkaloid extract of *T. Polium* have good antibacterial activity and it can be used in the treatment of pyelonephritis instead of antibiotic.

Keywords: *Teucrium polium L.; alkaloid extract; pyelonephritis; rats.*

Introduction

In recent years, due to alarming increase in the rate of infections with antibiotic resistant microorganisms and side effects of some synthetic antibiotics, there is increasing interest in medicinal plants as a natural alternate to synthetic drugs. Plants are known to produce a variety of compounds to protect themselves against a variety of their own pathogens and therefore can serve as antimicrobial substances[1,2]. *Teucrium polium L.* (family *Lamiaceae*) is a medicinal plant growing in the western Mediterranean region. *T. polium* is a grass plant, durable, with 10-30 cm in height and callous white exterior that ordinarily have dispersal in rocky and sandy area of Europe zones, North of Africa and South West of Asia[3]. *T. polium* has been used for different pathological conditions such as anti-diabetic, anti- spasmodic, anti-inflammatory, analgesic, and anti-oxidant effects[4-10].

In view of the reported literature, the medicinal reputation of *T. polium* plant stills the researcher's attention. The present study was carried out to investigate the possibility of the drug in the treatment of urinary tract infections and pyelonephritis induced by Escherichia coli in rats.

Materials and Method

Extraction and Isolation: *Teucrium polium L.* was collected from Basrah, Iraq. The aerial parts were separated, dried for one week in the shade at room temperature and then ground to a fine powder, and stored at 7°C in glass containers until used**.**The powdered plant material (250 gm) was extracted with a suitable volume of ethanol and 10% acetic acid on continuous mixing under room temperature for 4 hours. The mixture was filtered by using filter paper and concentrated by a rotary

evaporator at 70°C. The sulfuric acid (2%) was added to the concentrated filtrate and the concentrated filtrate was treated with concentrated ammonia until the pH=9, then the solution was filtered and separated by addition 20 ml of chloroform. This procedure was repeated three times and then the organic layer was isolated and dried at room temperature[11].

Bacterial Strains: Five bacterial species used in this study. The gram–positive species were *Staph scuiri (S. scuiri)* and Gram negative species bacteria were *Escherichia coli (E.coli), Pseudomonas aeruginosa (P.aeruginosa),Proteus sp*., and *Klebsilla pneumoniae (K.pneumoniae)*. These species were originally isolated from patients and identified by standard biochemical reactions.

Antibacterial Susceptibility Testing: Agar well diffusion method was followed for the determination of antimicrobial activity. The assay was conducted as described by[12]. Briefly, microorganisms from growth on nutrient agar incubated at 37°C for 18 hrs. were suspended in saline solution 0.85% NaCl and adjusted to a turbidity of 0.5 Mac Farland standards (10^8 cfu/ml). The suspension was used to inoculate 90 mm diameter Petri plates with a sterile nontoxic cotton swab on a wooden applicator. Eight millimeters diameter wells were punched in the Muller Hinton agar (MHA) and filled with 100 µl of 250 mg/ml of alkaloids and other compounds isolated from *T.polium*. The dissolution of the compounds was aided by 1% (v/v) DMSO which did not affect microorganism's growth, according to our control experiments. Commercial antibiotics were used as positive reference standard to determine the sensitivity of the strains. Discs were directly placed onto the bacterial culture. Plates were incubated at 37°C for 24 h. Antibacterial activities were evaluated by measuring inhibition zone diameters by millimeter.

MIC Determination: Minimal inhibitory concentration (MIC) of alkaloidal crude extract of *T.polium* was determined by agar Well diffusion method. Alkaloidal crude extract was dissolved in DMSO into different concentrations (1, 2, 3, 4, 5, 10, 15, 20, 25, 30, 35, 40, 80, 160, 200 mg/ml). Standard inoculums of bacteria were spread on Muller Hinton Agar (MHA). Wells were made on the plates using yellow tip (8 mm diameter). Each sample of alkaloidic compounds (100 µl) was poured into the well and incubated for overnight at 37°C[13]. The lowest concentration at which zone of inhibition appeared was considered as MIC.

Animals: Adult female rats (150-200 g) was purchased from the animal house of the College of Veterinary Medicine/University of Basrah, Basrah, Iraq. The animal house temperature was maintained at 20± 2°C with a 12 h light/dark cycle. All animals were kept for one week prior to experimentation and were given free access to food and water.

Experimental Design: To induce experimental pyelonephritis animal, rats (n = 18) were injected with 0.5 mL of a freshly prepared *E. coli* solution into their left renal medullae [14]. Control rats (n =6) were administered 0.1 mL of distilled water. Pyelonephritic rats were divided into randomly and equally into 3 groups: first group considered as control,second group as treatment that received by intraperitoneal of 1 mL/rat (equivalent to 0.6 g/kg body weight) of alkaloid crude extract for 10 days, while third group were treated i.p. with 0.5 mL/rat of antibiotic gentamycin for 10 days. After collecting the blood samples, they were left for half an hour, to be coagulated. Then, blood serum was separated by centrifugation for 10 minutes at 3000 rpm. Biochemical parameters such as urea and creatinine (CRT) were measured by kinetic (Enzymatic) and colorimetric method.

Statistical Analysis: The data were analyzed as mean ± SD of variables in different groups using statistical program for social science (SPSS-18). $P \leq 0.05$ was considered as the significant level.

Results and Discussion

The results of antibacterial activity of alkaloidal crude extract of *T.polium* against some pathogenic bacteria are shown in (Table 1). The results showed that antibacterial of alkaloid extract gave inhibitory efficacy against the studied bacteria relative to other active compounds isolated from *T. polium* where the diameter of the inhibition zone of alkaloid extract against E.coli, S.scuiri, P.aeruginosa and K.pneumonia was 25 mm while the alkaloidal extract showed the highest inhibitory diameter against proteus sp. where it was 30 mm. MIC results showed that MIC of alkaloidal crude extract against E.coli and proteus sp. was 40 mg/mL while MIC against P.aeruginosa, K.pneumonia and S.scuiri were 4, 5, 10 mg/mL respectively as shown in (Table 2).

Table 1: Antibacterial activities of alkaloid extract of T.polium against some urinary tracts bacteria

Bacterial species	Concentration of alkaloidal crude extract (mg/ml)	Antibiotic					
	250	ER	CAZ	TE	VA	CN	CIP
E.coli	25	25	15	R	R	R	R
S.scuiri	25	8	R	16	2	R	R
P.aeruginosa	25	21	14	18	27	R	23
K.pneumoniae	25	26	17	R	15	R	R
Proteus sp.	30	40	17	R	R	17	R

R: Resistant, ER: Erythromycin 15 µg; CAZ: Ceftazidime 30 µg; TE: Tetracycline 30 µg; VA: Vancomycin 30 µg; CN: Gentamycin 10 µg; CIP: Ciprofloxacin 5 µg

Table 2: The minimal inhibitory concentrations of alkaloid extract isolated from T.polium in mg/ml

Bacterial Species	MIC of alkaloidal crude extract (mg/ml)
E.coli	40
S.scuiri	10
P.aerginosa	5
K.pneumonia	4
Proteus sp	40

Following the induction of pyelonphritis (10 days after adminstration of *Esherichia coli*) the pateints rats showed highly significant increased (27.217±2.6263 vs. 42.233±17.044 and 0.666± 0.2065 vs. 0.366± 0.1366, in urea and creatinine, respectively P<0.05,Table 3) as compared to the control group. However, 10 days after the initiation of treatments, alkaloid extract and gentamycin treated rats showed a significant decrease (0.243±0.1181 and 0.293±0.0265 in urea of treated rats with alkaloid extract and gentamycine, respectively vs. 0.666±0.2065 in untreated rats, P<0.001, Fig. 1), while alkaloid extract treated rats showed a signifiant decrease (29.100± 9.1945 vs. 42.233 17.044, P<0.05, Fig. 2) in level of urea as compared to the paients group.

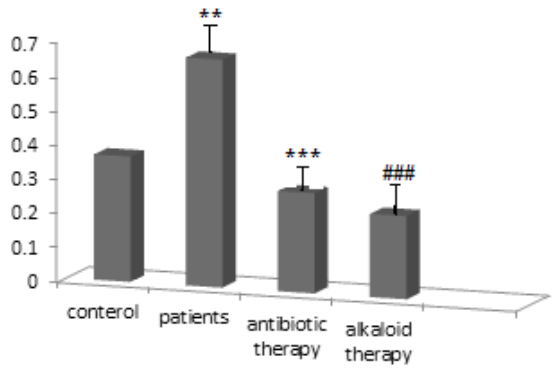

Fig. 1: effect of alkaloid extract of T.polium on the level of creatinine in treated pyelonephritis group as compared to untreated pyelonephritis rats.

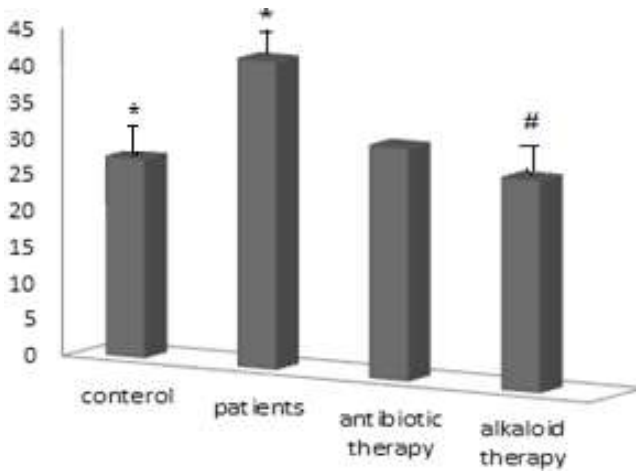

Fig. 2: The effect of alkaloid extract of T.polium on the level of urea in treated pyelonephritis group as compared to untreated pyelonephritis rat

In Figure 1,the effect of alkaloid extract of *T.polium* on the level of creatinine in treated pyelonephritis group as compared to untreated pyelonephritis rats. Data are presented as mean ± SD. ** indicates a signficant difference (P<0.01) between patients and control group, *** indicates a signficant difference (P<0.001 significance between antibiotic therapy and patients group, ### indicated a significant difference (P<0.001) between alkaloid therapy and patients group.

In Figure 2,the effect of alkaloid extract of *T.polium* on the level of urea in treated pyelonephritis group as compared to untreated pyelonephritis rats. There was also a significant difference in pyelonephritis rats as compared to healthy control group. Data are presented as mean ± SD. * indicates a signficant difference (P<0.05) between patients and control groups, # indicates a signficant difference (P<0.05) between alkaloid

Table 3: Compartion between the biochemical parameters in phylenophritis and normal groups.

Group	Biochemical Parameters	
	Urea	Creatinine
Control	27.217±2.6263	0.366±0.1366
Patients	42.233±17.0448	0.666±0.2065**
Gentamycin therapy	31.916±7.6122	0.293±0.0265***
Alkaloid therapy	29.100±9.1945#	0.243±0.1181###

Data are presented as mean as mean ± SD. * indicates a signficant difference (P<0.05) between patients and control groups, # indicates a signficant difference (P<0.05) between alkaloid therapy and patients groups, ** indicates a signficant difference (P<0.01) between patients and control group, *** indicates a signficant difference (P<0.001 significance between antibiotic therapy and patients group, ### indicated a significant difference (P<0.001) between alkaloid therapy and patients group.

Discussion

On the basis of this study, alkaloidal crude extract from the aerial parts of *T.polium*is effective against both gram-positive and gram-negative bacteria. Alkaloid crude extract at 250 mg/ml showed high antibacterial activity, so these finding support the previous report by Singh et al.[15] and [16] who indicated an alkaloids have physiological effects and a great medical effect to treat many diseases, including urinary tract infections. Cowan [17]showed that The mechanism of action of alkaloids is the formation of chemical bonds between these active compounds and the nucleic acids (DNA, RNA) of these microorganisms and then inhibit metabolism. While[18]attributed the effectiveness of alkaloids to the interference with the respiratory chain enzymes containing the thiol group. Through substitution and replacement in the carbonyl group, the alkaloids are transformed into a more toxic compound. It also lead to the mutagenic proteins and interfere with the protein enzymes containing the thiol group and lead to the moth and sedimentation of cellular proteins and through the ability to link with the enzymes involved in the building of amino acids and enzymes involved in the construction of proteins, which leads to inhibition of work and the most important of these enzymes DNA ligase and RNA polymerase. The alkaloids act to break the covalent bonds of the nucleotides and thus destroy the DNA of the microorganism. The MIC for *K.pneumoniae,P. aeruginosa* and *S. scuiri* was found at (4, 5, 10 mg/ml)respectively, while for *E. coli* and *Proteus sp.* was 40 mg/ml. This result is accordance with Darabpour et al.[19] who confirmed that *Escherichia coli* and *Proteus sp.* were more resistant than others. This observed resistance probably could be due to the presence of outer membrane of peptidoglycan in *E.coli* and *proteus* mayprevent the transport of compounds into the cell or due to other genetic factors. Our results also showed alkaloid crude extract of *T.polium* has high activity against pyelonephritis induced in rats. A significant decrease in serum urea and creatinine was observed in rats with pyelonephritis after 10 days of treatment with alkaloid extract. These results confirm several previous studies that *T. polium*can be used anti-inflammatory [7].

In conclusion, the findings of the current study illustrate that intraperitoneal administrated alkaloid extract of *T.polium* improved the renal function and good antibacterial alternative to antibiotic. These data suggest that alkaloid extract of T.polium might have a future role in the treatment acute pyelonephritis.

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Conflict of Interest: Nil

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Ethical Clearance: Not required

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A Study of Complications of Infants of Diabetic Mothers in Babylon Teaching Hospital for Maternity and Pediatrics

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Abstract

Background: Infants born to diabetic mothers are liable for a wide range of systemic & metabolic complications.

Objectives: The aim of this study was to do early detection and early managements of signs and symptoms and complications that happened in infants of diabetic mothers. Also to show the outcome of infants of diabetic mothers.

Materials and Method: Medical history, physical examination, and investigations (biochemical & radiological) were done on 100 infants of diabetic mothers over about 5 months period.

Results: We found that 78% of cases delivered by caesarean section, and 55% of them have history of affected baby, 27% history of miscarriage & 9% chronic sibling morbidity & these results might be due to poor glycemic control, bad antenatal care, or maternal & social neglect. Macrosomia was 42%. Congenital anomalies include congenital heart disease 16%, Birth trauma occurs in 5% in form of fracture clavicle & brachial plexus injury. Hypoglycemia presented in 85%. Perinatal mortality, birth injuries, systemic, hematologic & metabolic complications are more encountered in infants born to diabetic mothers.

Conclusion: Infants of diabetic mothers have a lot of risky complications and they need screening even in asymptomatic cases.

Keywords: *Complication, infant, diabetic mother.*

Introduction

Infants of diabetic mother are those born to a mother who has persistently elevated blood sugar during pregnancy.[1]

Diabetes has long been associated to maternal and perinatal morbidity and mortality[2,3]. Since the discovery of insulin; infants of diabetic mothers have experienced an almost 30 fold decrease in mortality and morbidity.[3] Of mothers with preexisting diabetes, 35% had type 1 diabetes mellitus, and 65% had type 2 diabetes mellitus.[4]

Maternal hyperglycemia causes fetal hyperglycemia, which contributed to that complications on infants of diabetic mother.[5]

Hyperglycemic hyperinsulinemic state leads to fetal macrosomia which causes birth asphyxia, cardiomyopathy, respiratory distress syndrome, polycythemia and iron abnormality which in turn lead to poor neuro developmental outcome.[6]

Chronic fetal hyperglycemia and hyperinsulinemia increase the fetal basal metabolic rate and oxygen consumption leading to a relative hypoxic state . The fetus responds by increasing oxygen-carrying capacity through increased erythropoietin production, potentially leading to polycythemia.[7]

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Prior to birth, elevated insulin levels inhibit the maturational effect of cortisol on the lung, including the production of surfactant from type 2 pneumocytes. This puts the fetus at risk for developing respiratory distress syndrome.[8]

Other comorbidities include miscarriages,birth defects[9], metabolic disturbances such as hyperglycemia, hypoglycemia, and hypoxia.[10] Growth Restriction occurs in pregnancy because of underlying vascular disease[11]. Hyperinsulinemia results in excessive fetal growth. All organs are involved except the brain and kidney.[12]

Birth injuries e.g. shoulder dystocia, brachial plexus injury, and cephalhematoma are also common.[13] Hypoglycemia especially occurs in early hours of life which may be asymptomatic or symptomatic like irritability, lethargy, poor feeding, and seizure.[14]

Those infants are also liable for pulmonary disease e.g. RDS and primary pulmonary hypertension [15], hyperbilirubinemia, polycythemia, hypocalcaemia with or without hypomagnesaemia believed to be secondary to parathyroid hormone suppression.[16]

Cardiomyopathy and inter ventricular hypertrophy may occur in these infants and detected by echocardiography.[17]

The aim of this study was to do early detection and early managements of signs and symptoms and complications that happened in infants of diabetic mothers. Also to show the outcome of infants of diabetic mothers.

Materials and Method

From (3754) neonates admitted to Babylon maternity and pediatrics teaching hospital at period from 1st. April 2009 to 17th. August 2010 we found 100 neonates of pregnant diabetic mothers. We took history from those mothers regarding type of diabetes, its treatment, parity, age, history of affected neonates or miscarriage, and calculated gestational age, also we looked for type of delivery and its events.

We studied in neonates of diabetic mothers, the early moments of life regarding APGAR score, resuscitation, examinations, early investigations needed accordingly and managements.

We look for biochemical and radiographic abnormities in those neonates as follows:

Serum blood glucose which taken by peripheral venous blood examined by spectrophotometer or by glucometer digital measuring total serum bilirubin taken by heel prick test read by bilirubinometer, packed cell volume taken from peripheral venous sample, serum calcium by non-tourniquet venous sample, blood culture taken via cleaning the punctured area with alcohol and take venous sample for suspected cases of sepsis. Chest X-ray, echocardiograph, electrocardiograph, abdominal ultrasound and brain ultrasound & CT scan of brain as needed.

Results

64% of mothers have gestational diabetes, 36% as pre-existing DM, 27% are primigravida & 35% have age less than thirty years, 78% neonate delivered by caesarean section, male neonates 58% & females 42% .

History of affected baby 55% as we regard macrosomia as congenital malformation & history of miscarriage 27%. Sibling with history of chronic morbidity 9%.

Regarding hospital staying: 1st day discharge 16%,2nd day discharge 22%, 3rd day discharge 46%, & 4th day discharge 16%.

Perinatal Mortality rate in these one hundred cases are 4% due to (two with complex congenital malformation, one with still birth, & one from respiratory failure), morbidity rate 85% as medical & biochemical abnormalities need intervention only 11% are apparently normal & from those 11% are nine mother with strict glycemic control .

The APGAR score 30% have less than 4 score in 1st minute & increase to more than 4 score at five & ten minutes as 78% & 93% respectively.

In 1st day of life 85% have respiratory rate more than 60 breath/minute while at the 4th. day the respiratory rate less than 60 is 68%. The grunting present in 85% in 1st day & become 20% at 4th. day of life.

The oxygen saturation improve in 9% of patients whom complain of hypoxia at 1st. day to reach 4% at the 4th. day of life .

The heart rate > 160 beats/minute in 1st day was 10% & only 2% still tachycardia at the end of the 3rd. day of life .

Hypoglycemia improve from the1st.day to the 4th. day as 86% to 4% respectively .

The hematocrit > 65% present only in 9% & only 3 patients need partial blood exchange transfusion.

The respiratory complications was about 33% as hyaline membrane disease & transient tachypnea of newborn 45%, 2% complicated to respiratory failure, 1% pneumothorax, 1% eventration of diaphragm (Figure 1).

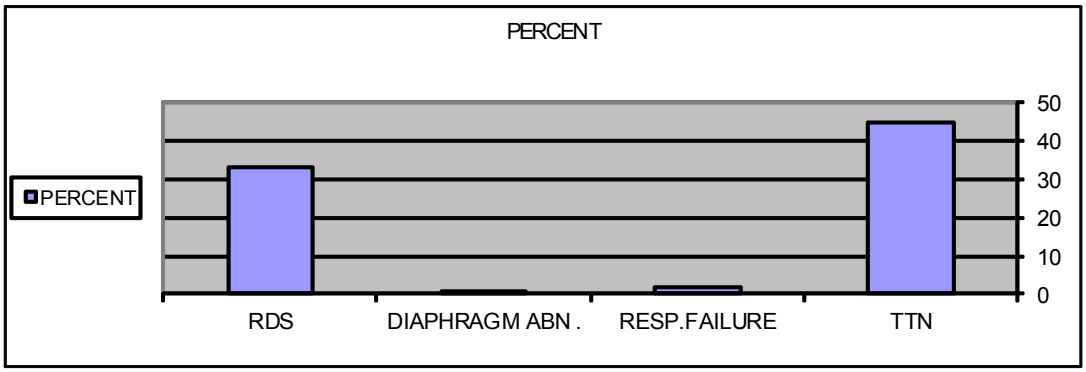

Figure 1: Percentages of respiratory complications proportions

In relation to the cardiac complications seen in 16% as following 6% have murmur in 1st. four day of life, and 7% have heart failure documented by chest X ray and echocardiograph, 3% have VSD, 1% PDA,1% ASD, cardio myopathy in 2% (Figure 2).

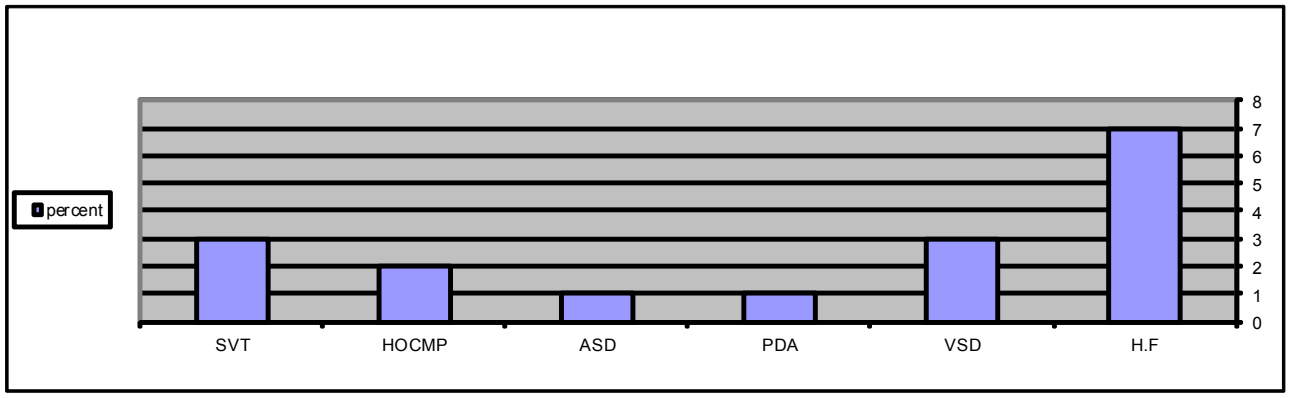

Figure 2: Percentages of cardiac complications

Regarding intestinal complications: 2% have Intestinal obstruction, 1% imperforated anus, 1% had diaphragmatic hernia.

The neurological abnormalities seen in 24% as following: 20% as birth asphyxia, 2% intracranial hemorrhage, 2% neural tube defect, 1% facial palsy as in Figure 3.

The skeletal complications as: 1% congenital dysplasia of the hip, 1% absent left hand & 5% has shoulder dislocation with or without clavicular fractures (Figure 3).

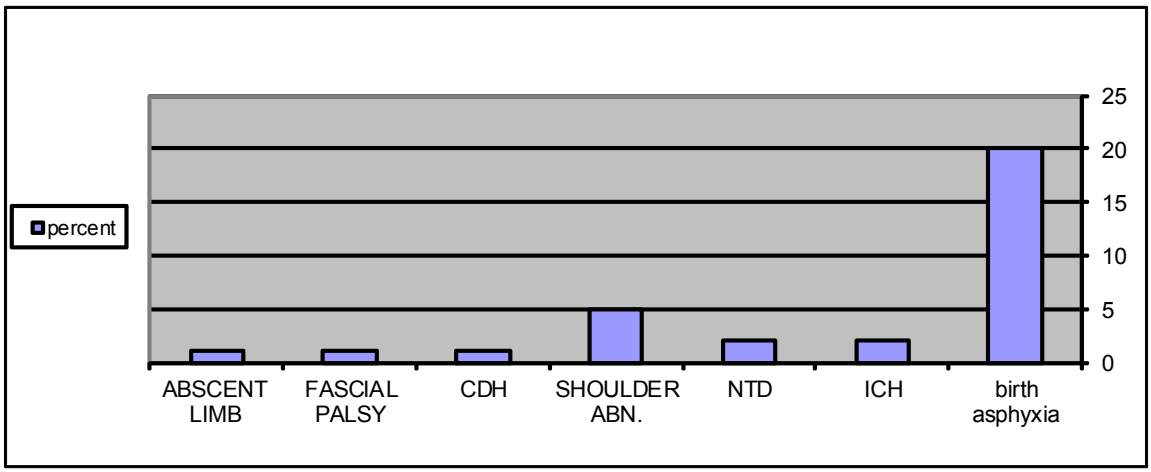

Figure 3: The neuro-skeletal complications proportions

Genito-renal abnormalities as 2% undescended testes, 1% hypospadias, 1% single kidney.

Neonatal jaundice present in 40%, one fifth of them in 1st day & about half appear in the 2nd day of life & 12 patients (12%) need blood exchange transfusion. The body weight from 2-3.5 kg about 48%, ≥4.6 kg about 52%, as in Figure 4.

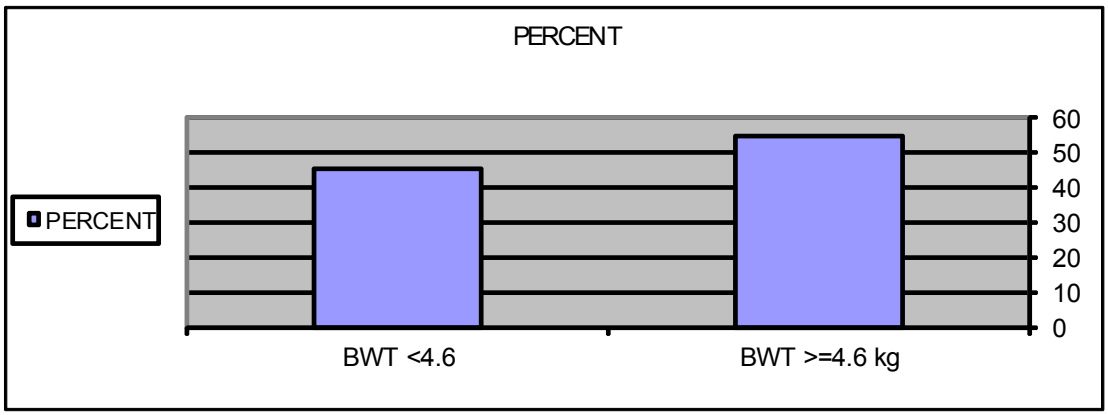

Figure 4: Percentages of body weight proportions.

Discussion

In our study, we found 78% of cases delivered by caesarean section which is higher than the results found by Cousins which is 45% & this might be due to bad obstetric history, fetal macrosomia, failure of induction of labor, or obstetrical miscalculation [18]

We found 55% have history of affected baby, 27% history of miscarriage & 9% chronic sibling morbidity & these results might be due to poor glycemic control, bad antenatal care, or maternal & social neglect.

Macrosomia is 42% but in Thomas R. Moore (15-45%) & to Charles F. Potter (26%). This might be due to good glycemic control in their study.[19]

Perinatal mortality was 4% which is highly different to results in study of Charles F. Potter which was about 30 -50% & specially to infant with gestational diabetes, this might be due to small number of my study as in figure 5.[20]

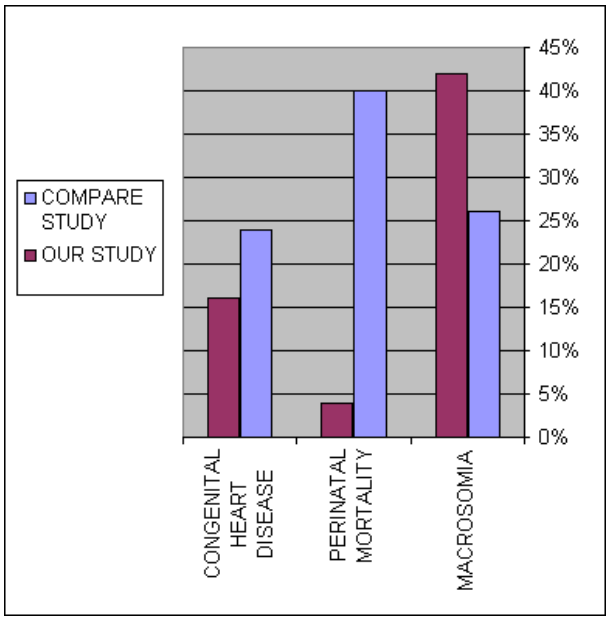

Figure 5: Differences between our study & compared study regarded macrosomia, perinatal death, & congenital heart disease.

Congenital anomalies include congenital heart disease 16% which is closer to 16% by-Moore & slightly lower than Charles F. Potter 24% & hypertrophic cardiomyopathy 7%. [19] Birth trauma occurs in 5% in form of fracture clavicle & brachial plexus injury which is relatively similar to the result of Thomas R. Moore about 4% this might due to macrosomia, or need of assisted vaginal delivery. [19]

Hypoglycemia present in 85% which higher than the result of Moore where the result about 62% [19].

Respiratory distress syndrome about 33% which is slightly higher to 26% of Thomas R. Moore & it is statistically significant, this might due to increased incidence of cesarean section or prematurity & this could be supported by about 40% is the percent of prematurity by pediatric examination in this study .[19]

Jaundice was seen in 40% of cases while 25.5% in Moore could be caused by hemolysis or polycythemia.[19]

Polycythemia seen in about 9% which is closet to 5-10% of the result in Thomas R. Moore & this could be the result of fetal hypoxia as in figure 6.[19]

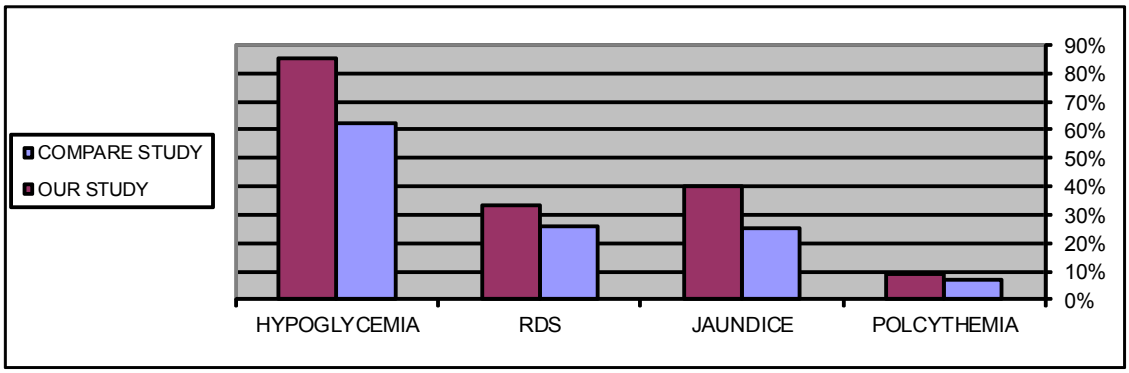

Figure 6: Differences between our study & compared study regarded hypoglycemia, respiratory distress syndrome, jaundice & polycythemia.

Hypocalcemia was seen in 10% in compare to 6% result of Thomas R. Moore [19]. Preterm by clinical examinations are about 40% while show 29% by Charles F. Potter.[7]

Conclusion

There is good relation between strict glycemic control & near normal neonates, so fetal life without hyperglycemic state & without subsequent hyperinsulinemic state lessen complications & vice versa. It is important to screen for neonatal hypoglycemia even in asymptomatic patients because a lot of patient have asymptomatic hypoglycemia. Neonates of diabetic mothers have a lot of risky complications to be screened for. Good dietary techniques & doing caesarean section decrease the risk of birth trauma (in our study we show about 80% of affected neonates with perinatal injury were due to normal vaginal delivery). Most teratogenic complications occur in infant born to mother with diabetes that is poorly controlled.

Ethical Clearance: The study was conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki. The study protocol and the subject information and consent from were reviewed and approved by a local Ethics Committee.

Conflicts of Interest: None of the authors have any conflicts of interest relevant to what is written.

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The Relationship between Obesity and Dyslipidemia in Adolescents

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Abstract

Background: Obesity is a condition of chronic accumulation of body fat and a factor for the onset of serious diseases such as dyslipidemia. Obesity and dyslipidemia are emerging as significant public health challenges in South Asian countries

Aim: This study aimed to assess the association of obesity with dyslipidemia by measuring LDL and HDL in adolescents

Method: This study is an observational analytic study with a cross-sectional design. Sixty-two adolescents aged 17-19 years were randomly using systematic random sampling. LDL and HDL, anthropometric (weight, height, and BMI). Analysis data was performed using an independent t-test, chi-square test, and Fisher test

Results: The results showed that the samples with a high risk for the measurement of LDL and HDL.

Conclusions: It was concluded that obese adolescents have close links with dyslipidemia and have low HDL level. Obesity in adolescents is essential as early as possible so that it does become a significant health problem.

Keywords: *Obesity, Dyslipidemia, LDL, and HDL.*

Introductions

Obesity is a chronic disease that can cause various other degenerative diseases. The development of the problem of obesity has been widespread throughout the country, and its occurrence has increased every year for the past 40 years. The increase in the incidence of obesity also increases the increase in the incidence of degenerative diseases. Such as dyslipidemia which even increased in adolescence.

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The Problem of Body Weight Proportion has experienced a very remarkable development, from 1975 to 2014, with changes in the average value of BMI of the world's population, ranging from 21.7 kg/m^2 in 1975 to 24.2 kg/m^2 in 2014, where in males from 22.1 kg/m^2 in 1975 to 24.4 kg/m^2 in 2014. These data indicate that an increase in BMI of the world population supports a positive shift towards obesity BMI. And finally in 2014 the face of the world changes increasingly concentrated due to obesity problems with the prevalence of morbidity due to obesity globally of 0, 64% of male sex and 1.4% of women[1]. Thus, the change in BMI of the world's population for four decades supports the spread of obesity to high mortality rates.

Likewise, the development of the problem of obesity in Indonesia is clearly illustrated in the 2007 Riskesdas data with the national prevalence of obesity in people

aged> 18 years by 13.9% and becoming 19.7% in 2013 [2]. The picture of the population above the age of 18 shows that for the Indonesian population the coverage of adults and the elderly has a problem of obesity which is quite alarming and requires special attention in their snacks.

The incidence of obesity for South Sulawesi has experienced a very large increase. The prevalence of obesity in the Selayar Archipelago District is 32.49% greater than the prevalence of obesity at the provincial level in South Sulawesi which amounted to 23.67% in 2016.

Where in adolescence, obesity, drugs cannot be done because they are still in growth period. While on the other hand the condition of obesity experienced by adolescents raises new problems namely dyslipidemia.

LDL and HDL changes that occur in adolescents can cause dyslipidemia problems more quickly at a younger age. This change is a very big dynamic from very high LDL and very lace HDL in adolescents. Or a standard LDL level but a very low HDL level.

This study aimed to assess the association of obesity with dyslipidemia by measuring LDL and HDL in adolescents. The purpose of this study is to prove that there are changes in LDL and HDL in adolescents due to their obesity. This is important to be the reason for the importance of promoting obesity treatment in adolescents. To prevent dyslipidemia.

Method

In our respondents we measured LDL, HDL, and anthropometric measurements including abdominal circumference using measuring tape, body weight with weight scales, height with microtoa, and BMI (Body Mass Index).

BMI measurement by calculating body weight in Kg divided by height in meters squared. Like the following formula:

$$BMI = \frac{weight(Kg)}{(height\ (m))^2}$$

Measurements of LDL and HDL were carried out as a result of venous blood tests taken from adolescents and measured in Lab. Prodia Makassar, Indonesia.

The data of this study were analyzed by independent t-test, chi-square test, and Fisher test to see the relationship of several measured variables.

Results

The results of this study

Table 1. Characteristics of Adolescent Respondents

Variabel	N	%
Gender		
Men	27	43.5
Women	35	56.5
Age		
17	5	8.1
18	45	72.6
19	12	19.4
Central Obesity		
Normal	21	33.8
Obesity	41	66.2
BMI		
Normal	22	35.5
Obesity	40	64.5

Based on table 1 above shows the majority of respondents are female adolescents with a percentage of 56.5%. and dominated by 18 years old with 72.6%. Respondents who had central obesity based on measurements of abdominal circumference were 66.2%, and for respondents who were obese based on the results of BMI measurements were 64.5%.

Table 2. Lipid Profile and Obesity According to Central Obesity of Adolescent

	Central Obesity		
Variable	**Normal Mean ± SD (n=21)**	**Obesity Mean ± SD (n=41)**	**P**
HDL	51.9 ± 10	43.9 ± 7	0.001
LDL	98 ± 18	115 ± 33	0.01
LDL/HDL	2.2 ± 0.58	2.6 ± 1	0.063

From table 2 above shows that HDL levels in adolescents with central obesity conditions are much lower than in adolescents with normal abdominal circumference which is a mean of 43.9 ± 7 with a value of P <0.005.

Table 3. Lipid Profile and Obesity According to Body Mass Index of Adolescent

	Body Mass Indeks		
Variable	**Normal Mean ± SD (n=22)**	**Obesity Mean ± SD (n=40)**	**P**
HDL	51.4 ± 10.4	44 ± 7.6	0.002
LDL	98.2 ± 17	116.3 ± 32.8	0.007
LDL/HDL	2.2 ± 0.6	2.6 ± 1.05	0.057

In table 3 above shows that adolescents with obese conditions have very low HDL levels compared to normal adolescents. This obesity measurement was based on the Adolescent Body Mass Index adjusted for BMI chart percentile tables for children and adolescents based on CDC 2000.

Table 4. Obesity Based by Waist Circumferences According to Lipid Profile of Adolescent

Variabel		LDL					HDL					LDL/HDL				
		Hight Risk		Low Risk		P	Low Risk		Hight Risk		P	Low Risk		Hight Risk		P
		N	%	N	%		N	%	N	%		N	%	N	%	
Central Obesity	Obesity	29	70.7	12	29.3	0.153 *	14	34.1	27	65.9	0.036*	11	26.8	30	73.2	0.046**
	Normal	11	52.4	10	47.6		2	9.5	19	90.5		1	4.8	20	95.2	

*Chi-square test, **Fisher test

Based on table 4 above shows that central obesity has a close relationship with HDL levels and LDL/HDL ratio which shows a close relationship with the risk of heart disease. This is seen as a significant value from the Chi-squer and Fisher test analysis results as attached in table 4 above.

Table 5. Obesity Based by Body Mass Index According to Lipid Profile of Adolescent

Variabel		LDL					HDL					LDL/HDL				
		Hight Risk		Low Risk		P	Low Risk		Hight Risk		P	Low Risk		Hight Risk		P
		N	%	N	%		n	%	N	%		N	%	N	%	
Obesity by BMI	Obesity	29	72.5	11	27.5	0.076*	13	32.5	27	67.5	0.104*	11	27.5	29	72.5	0.042**
	Normal	11	50	11	50		3	13.6	19	86.4		1	4.5	21	95.5	

*Chi-square test, **Fisher test

Based on table 5, the relationship of obesity based on BMI in adolescents shows a very close relationship with the LDL/HDL ratio for those who are at high risk of heart disease.

Discussion

This study provides an overview of the relationship of Obesity in adolescents both based on BMI and Abdominal Circumference have very low HDL levels and this poses a severe risk for heart disease in the future. This research provides evidence of the obesity conditions experienced by adolescents putting the burden of other health problems. And giving the weight of obesity management treatments is important given to adolescents to prevent the occurrence of diseases due to weight gain.

The high prevalence of dyslipidemia problems in children is higher in the community of children with obesity so that the examination of lipid profiles in children with obesity is needed for prevention[3]. Conditions like this have a bad impact on their health status in adulthood[4].

One important determinant that can cause early atherosclerosis problems at a younger age is adiponectin[5]. Low adiponectin is associated with atherogenic lipid profiles[6]. Likewise, the problem of cardio vascular disease in adulthood is suspected of having begun since childhood[7]. This is the main key to the importance of examining the lipid profile in the condition of observation both in children and adolescents.

Because further research is still needed to answer and provide a big picture of this in younger age groups and the involvement of more respondents.

Conclusion

Based on the results of this study it can be concluded that obesity experienced by adolescents can reduce HDL levels in lipid metabolism in adolescents' bodies and has a high risk of the appearance of heart disease.

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The Individual Factor and the Quality of Building's Physical Environment in Correlation with the Occurrence of Sick Building Syndrome (SBS) on Employees of PT. Telkom Jember

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Abstract

Sick Building Syndrome (SBS) is a situation in which occupants complained about health and comfort issues, which are related to time spent in a building, but the symptoms are not specific and the cause can't be identified, such as lethargy, nasal congestion, dry throat, headache, itchy eyes, sore eyes, dry eyes, runny nose, tense eyes, sore, sore neck or back, in the same period. There are 45.7% of employees in PT. Telkom Jember who got Sick Building Syndrome. This study aims to analyze the correlation of individual factor and quality of the physical environment of building with Sick Building Syndrome occurrence of employees in PT. Telkom Jember. This study uses an analytical study with Cross-Sectional approach. The populations were employees of PT. Telkom Jember. The samples were 35 respondents using Simple Random Sampling technique. The analysis used chi-square test (a = 0.05). The results showed that there was a correlation between age, occupation, and smoking behavior with Sick Building Syndrome (p-value <0.05) and there wasn't a correlation between sex, psychosocial condition, nutritional status and physical environment quality (temperature, humidity, airflow velocity, and illumination) with the occurrence of Sick Building Syndrome (p-value> 0.05). It can be concluded that the incidence of Sick Building Syndrome on employees of PT. Telkom Jember is less experienced by Sick Building Syndrome.

Keywords: *Sick Building Syndrome (SBS), individual factors, the quality of the physical environment.*

Introduction

In the last twenty years in the world, there have been a lot of high-rise buildings completely enclosed with air vents that depend entirely on various machines, such as offices or offices which are one of the workplaces that use ventilation with an Air Conditioning (AC) system. This causes pollution, especially air pollution caused by system ventilation Air conditioner has its own air circulation so that it will affect indoor air quality[1]. At a glance, the luxuriously constructed building rooms are equipped with adequate infrastructure, and the air conditioner that can be arranged as comfortably as possible is considered a very comfortable place to work. But in fact, it is precisely in a room like this that the health of people who work is often disrupted[2]. Various complaints and symptoms can arise when someone is in the building. Air quality, temperature, radiation, ventilation, lighting and the use of various chemicals in the building, are very potential causes for the emergence of complaints and symptoms in workers/employees when they are inside the building[3].

According to the Head of the National Population Agency (BAKNAS) around the world, an estimated 2.7 million people die from indoor air pollution. Even though 70-80% of most human time is spent indoors. EPA consistently ranks indoor air pollution as the top five for environmental health risks in public health.

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The incidence of Sick Building Syndrome (SBS) is caused by many factors including chemical factors such as CO, CO2, formaldehyde, asbestos, and dust, then physical factors are related to temperature, humidity, airflow velocity, lighting, biological factors also affect such as bacteria and fungi and individual characteristics such as age, gender, smoking, length of work and psychosocial factors[4]. According to the results of research at PT. Infomedia Surabaya obtained data that the physical factors of air quality cause discomfort and health problems for employees who work including skin, eye, nose, nerve disorders, and respiratory disorders[5].

Sick Building Syndrome can usually be a dry cough, headache, eye irritation, nose and throat, dry and itchy skin, weak body and others. These complaints usually persist for at least two weeks. Complaints that are usually not too great, but quite disturbing and of course this can affect the productivity of work of someone who is exposed to this disease. Sick Building Syndrome can be considered if more than 20% or even 50% of users of a building have complaints as mentioned before[1].

One of the tallest and most closed buildings in Jember Regency is located at Gajah Mada Street No.182-184, Jember regency consists of 8 floors. The results of the preliminary study conducted by researchers on 10 samples of employees of PT. Telkom Jember found that 50% of the samples felt symptoms of red eyes, watery eyes, dizziness, nausea, coughing, increased body temperature, lethargy, sneezing, frequent urination, dry throat and said the symptoms disappeared after leaving the building

Method

This study is an analytical study with a cross-sectional approach. The study population was the employees of PT. Telkom Jember. The number of samples is 35 respondents with sampling using the Simple Random Sampling technique. The exclusion criteria in this study are employees who suffer from chronic diseases that are considered to have similarities with SBS events, such as suffering from chronic illness (anemia), history of respiratory diseases, tuberculosis, eye diseases, diseases related to body metabolism (liver and kidney disease), have a history of allergies, and female employees who are pregnant.

The independent variables in this study were age, gender, years of service, smoking behavior, psychosocial conditions, nutritional status, temperature, humidity, air flow velocity, and lighting. The dependent variable in this study is the incidence of Sick Building Syndrome in employees of PT. Telkom Jember. The research data collection technique was conducted using a questionnaire for interviews, measurement, and documentation. The research data analysis technique used the chi-square test ($\alpha = 0.05$).

Result

The incidence of Sick Building Syndrome in employees of PT. Telkom Jember can be seen in the following table:

Table 1. The incidence of Sick Building Syndrome (SBS)

Incidence SBS	n	(%)
Not SBS	16	45,7
SBS	19	54,3

In table 1, it can be seen that the respondents who experienced the incidence of Sick Building Syndrome were 45.7%.

Distribution of Individual Factors and Physical Environmental Quality

Distribution of individual factors can be seen in the following table:

Table 2. Faktor Individu

Faktor Individu	n	%
Age		
≤40 years old	22	62,9
>40 years old	13	37,1
Gender		
Man	25	71,4
Woman	10	28,6
Working time		
≤10 year	25	71,4
>10 year	10	28,6
Smoking behavior		
Often	5	14,3
Sometimes	13	37,1
Not smoking	17	48,6
Psychosocial Condition		
Well	29	82,9
Bad	6	17,1
Nutritional status		
Thin	5	14,3
Normal	22	62,9
Fat	8	22,9

Based on table 2, the individual factors show that the employees in most respondents aged <40 years was 62.9%, male respondents were more than 71.4%, respondents who had a working period of <10 years were 71.4%, respondents who have smoking behavior that is equal to 51.4%, respondents who have good psychosocial conditions are equal to 82.9%, and respondents who have normal nutritional status that is equal to 62.9%.

The results of measuring the quality of the physical environment can be seen in the following table:

Table 3. Physical Environmental Quality

Variable	Floor					
	1	2	3	4	5	6
Temperature (°C)	30,1	30,3	31,8	30,6	29,4	28,1
Humidity (%)	63,2	59,5	61	59,9	63,9	51
Airflow speed (m/s)	0,85	0,80	0,85	0,18	0,24	0,71
Lighting (lux)	223	241	222	302	179	257

Based on table 3, related to temperature, humidity, air flow velocity, and lighting can understand that most are in accordance with the standards determined by regulations (KepMenkes RI Number 1405/Menkes/SK/XI/2002).

The relationship between Individual Factors and Sick Building Syndrome Events in PT. Telkom Regency of Jember:

Table 4. The relationship between individual factors and the incidence of Sick Building Syndrome in employees of PT. Telkom Jember

Individual factor variables	Sick Building Syndrome				P-value
	Yes		Not		
	n	%	n	%	
Age					
<40 Years old	7	31,8	15	68,2	0,032
>40 Years old	9	69,2	4	30,8	
Gender					
Man	13	52	12	48	0,285
Woman	3	30	7	70	
Working time					
<10 years	8	32	17	68	0,022
>10 years	8	80	2	20	
Smoking behavior					
Smoking	12	66,7	6	33,3	0,010
Not smoking	4	23,5	13	76,5	
Psychosocial condition					
Well	15	51,7	14	48,3	0,187
Bad	1	16,7	5	83,3	
Nutritional status					
Thin	1	20	4	80	0,326
Normal	10	45,5	12	54,5	
Fat	5	62,5	3	37,5	

In Table 4, the value of p-value of the age of 0.032 (p <0.05) means that Ho is rejected, the p-value of the working period is 0.022 (p <0.05), meaning Ho is rejected and the value of p-value of smoking behavior is 0.010 (p <0.05), meaning Ho is rejected.

The Relationship between Physical Environmental Quality and Sick Building Syndrome in PT. Telkom Jember:

Table 5. Relationships between Physical Environmental Quality and Sick Building Syndrome Incidents at PT. Telkom Jember

Physical Environmental Quality	p-value
Temperature	0,123
Humidity	0,631
Airflow Speed	0,631
Lighting	0,064

In table 5, shows that the p-value of the quality of the physical environment (temperature, humidity, the velocity of air flow, and lighting is greater than 0.05, which means that He is accepted.

Discussion

Based on the results of research on the relationship between the incidence of Sick Building Syndrome to employees of PT. Telkom Jember that there are several relationships between individual factors (age, years of service, and smoking behavior) with the incidence of Sick Building Syndrome in employees of PT. Jember Regency Telkom, while there is no relationship between several individual factors (gender, psychosocial conditions, and nutritional status) and the quality of the physical environment with the incidence of Sick Building Syndrome in employees of PT. Telkom Jember.

The results of research conducted on employees of PT. Telkom Jember can be seen that over 40 years of age experience SBS more than under 40 years of age.

Age is very influential on the level of risk of occurrence of a work-related illness including the incidence of SBS. The process of someone's aging causes a reduction in workability caused by changes in the functions of the body's instruments, the cardiovascular system, and the body's hormonal system[6].

The majority of employees of PT. Telkom Jember is male so that in buildings that are at risk of experiencing SBS are men, although, in theory, the riskier ones are women, because the results obtained from a total of 35 respondents who experienced SBS were 16 people, 13 of whom were men and 3 people are women. The male sex experienced more SBS complaints, this was due to several factors including the majority of the total number of employees in the building were male and most active smokers were susceptible to SBS complaints[7].

The results of research on employees of PT. Telkom Jember can be seen that the tenure of more than 10 years is more susceptible to SBS events compared to work periods of less than 10 years. Then it can be interpreted, the longer the working period of a person the more vulnerable the person experiences SBS[8].

Smoking behavior can cause changes in the structure and function of the respiratory tract and lung tissue. Smoking can also lower your lung's vital capacity compared to some occupational health hazards. Smoking habits will accelerate the decline in pulmonary physiology[3]. If the person is an active smoker, the person is more susceptible to experiencing SBS. This is because of the total 35 research respondents 18 of whom were active smokers, 12 of them experienced SBS events compared to passive smokers, and 3 people who smoked during working hours.

SBS complaints are also influenced by factors outside the environment, such as personal, occupational and psychological problems that are considered to affect one's sensitivity to SBS[9]. The results of research on employees of PT. This Telkom Jember can be seen that psychosocial conditions are not related to the incidence of SBS.

Nutritional status is the end result of the balance between food entering the body (nutrient input) with the body's needs (nutrient output) of these nutrients. The results of research on employees of PT. Telkom Jember can be seen that nutritional status is not related to SBS events. This is not in accordance with Budiono's theory (2003) that workers who have good nutritional conditions will have better work capacity and endurance[10].

The temperature is too high or low the body can feel fatigue faster than normal and experience various symptoms such as eye irritation, sore throat and coughing which are symptoms ofSBS[11]. The results of research conducted at PT. Telkom Jember can be seen that the temperature is not related to the SBS incident because the rooms are not only dependent on the AC but also the influence of the doors and parts of the window that is open so that the indoor air exchange can occur naturally. So that when measuring the average temperature in the room is normal (18-30°C).

Based on the NAB that applies to the work environment in accordance with the Minister of Health of the Republic of Indonesia Number 1405/Menkes/SK/XI/2002 for humidity, it ranges from 40%-60%. The results of the research in the building of PT. Telkomjember can be seen that humidity is not related to SBS events, this is because these rooms are not only dependent on central air conditioning, but also the influence of additional air conditioning, opening of lobby doors, central air conditioning that does not function properly and open windows so that the humidity in the room is not in accordance with the stipulated NAV.

Air speeds less than 0.1 meters/second or lower make the room uncomfortable because there is no air movement. Conversely, if the airspeed is too high it will cause noise in the room[3]. The results of the research on the building of PT. Telkom Jember can be seen that the speed of air flow is not related to SBS events, this is because the rooms are not only dependent on air conditioning/air conditioning systems but also from ventilation and open doors, so the condition of the air flow velocity in the building is unstable.

According to (Decree of the Minister of Health of the Republic of Indonesia Number 405/Menkes/SK/XI/2002) good lighting allows workers to see objects that they do clearly, quickly and without unnecessary effort[12].Moreover, adequate lighting gives a better view and a refreshing environment. Lighting problems include the ability of humans to see things, characteristics of the sense of sight. Poor lighting can result in eye fatigue with reduced power and work efficiency[12].The results of research on room lighting in the building of PT. Telkom Jember can be seen that lighting is not related to SBS incident. Based on the time of going down the study in the building of PT. Telkom Jember, these rooms not

only depend on artificial lighting but also the influence of natural lighting namely sunlight, so that employees of PT. Telkom Jember can easily adjust the need for light intensity in the workspace as needed. Normal light intensity makes the workplace feel comfortable and free of complaints caused by poor lighting.

This is in line with the statement of Acmadi (1991) stating that SBS is not caused by a single cause, but is a set of conditions that cover various kinds of environmental components related to low air quality, among others, related to physical factors namely temperature, humidity, and velocity of air flow, chemical factors, and partly biological factors. Some components of this cause together and each in a low dose will cause non-specific complaints called SBS[13].

Conclusions

The incidence of Sick Building Syndrome in employees of PT. Telkom can find out that those who did not experience Sick Building Syndrome were 19 respondents or equal to (54.3%).

There is a relationship between individual factors (Age, years of service, and smoking behavior) with the incidence of Sick Building Syndrome in employees of PT. Telkom Jember because the value of p-value is smaller than 0.05

Ethical Clearance: The study was approved by the Institutional Ethical Board of Public Health Faculty, Universityof Jember.

All subjects have been fully informed about the information and forms for the informed consent form.

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Conflict of Interest: All authors have no conflicts of interest to declare.

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Public Knowledge on Over the Counter Analgesics at Private Pharmacy Store in Makassar City Indonesia

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Abstract

Objectives: To determine the level of public knowledge of Makassar City on the use of Analgesics Over the Counter (OTC) drugs in the self-medication to pain treatment and also determined the role of the pharmacist in providing information about OTC to the community.

Method: This research is a quantitative approach cross-sectional study using a questionnaire which has been modified and validated. The sampling method used is incidental sampling by distributing questionnaires to the respondents that conducted in 3 Private Pharmacy Store in the city of Makassar.

Result: From 215 questionnaire, 200 were filled in correctly and analyzed (respond rate 93%). Paracetamol generic is the most popular analgesic (54.5%) of the questioned respondent prefer it to relieve the pain (Headache). More than 53% of respondent did not know how to take medicine and 60.5% of respondent were not read brochure before taking medicine. The respondent more confidence with doctor and family recommendation than the pharmacist in consultation.

Conclusion: The level of knowledge about the use of analgesic drugs Makassar city community still low and the role of the pharmacist as a source of drug information providers needs to be improved.

Keywords: *Knowledge, Analgesics, OTC, Pharmacy.*

Introduction

Self-medication is the treatment of common health problems with medicines especially designed and labeled for use without medical supervision and approved as safe and effective for such use[1]. Medicines for self-medication are often called 'nonprescription' or 'over the counter' (OTC) and are available without a doctor's prescription through pharmacies[2]. When practiced correctly, self-medication can save the time spent in waiting to see a doctor, may be economical and also offer savings for medical schemes and the national healthcare system. The WHO has also pointed out that responsible self-medication can help prevent and treat ailments that do not require medical consultation and provides a cheaper alternative for treating common illnesses[3]. With self-medication, the individual bears primary responsibility for the use of self-medication products. All parties involved in self-medication should be aware of the benefits and risks of any self-medication product[4].

More over, the consumers are not aware of the safety of these drugs and its frequent use may result in various adverse effect. It is the part of patients to read out the label packaging instructions for OTC medications to know how much one should take, the possible side effect that may encounter and the various condition and drug interactions should be considered before taking OTC drugs. Pharmacist and drug companies will have an increasingly important role in giving information and advices to the patients[5].

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Analgesics are the most widely and frequently used non-prescription medications. There are many analgesic drugs, dosage forms and analgesic therapeutic procedures available today. This will certainly also persist in the future, since there will never be a single analgesic drug suitable for all patients and all types of pain because of considerable inter-individual variability in the effect of analgesics. Even a respected analgesic drug will not relieve pain in all patients[6].

Urge of self-care, feeling of sympathy towards family members in sickness, lack of health services, poverty, ignorance, misbelieves, extensive advertisement and availability of drugs in other than drug shops are responsible for growing trend of self-medication[7]. Previous studies have confirmed that among the other age groups, OTC medicines are purchased and more often used by elderly patients who frequently have multiple comorbid diseases, and therefore use polypharmacy. As a result, drug-drug interactions between OTC and prescription medicines (Rx) may occur. While patients are aware of possible drug-drug interactions between Rx medicines, patient knowledge regarding interactions between OTC and Rx medicines has not been well studied, although the occurrence of the aforementioned interactions has been described as frequent[8,9].

Self-treatment of common illnesses by people is common in developing countries. Common reasons cited for self-medication are inaccessibility of health care facilities, economic constraints and previous experience of illness. Positive and responsible attitudes towards self-care and self-medication are spreading throughout the world. Thereis a demand by consumers for more information and particularly for reliable sources of information about healthcare in general and medicines in particular. In a comprehensive survey, members of patients' organizations expressed their strongest agreement with the need for improving healthcare systems through accurate, relevant and comprehensive information, to help them make informed decisions about treatment. Today the internet is emerging as a major source of information on health issues and (with appropriate quality control) offers great promise in helping people with self-care[10].

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Study on self-medication shows that it is influenced by many factors such as education, family, society, law availability of drugs and exposure to advertisements. A high level of education and professional status has been mentioned as predictive factor for self-medication. Pharmacist can play very important and active role in advising and educating consumers on the correct use of OTC analgesics. It is essential that the practicing pharmacists have information about patients' preferences, habits and individual experience in OTC analgesics in order to improve and rationalize their use[11].

Materials and Method

This research is a quantitative approach cross sectional study using a questionnaire (Lefterofa and Getov, 2004) which has been modified and validated with the permission of the manufacturer's questionnaire. The sampling method used is incidental sampling by distributing questionnaires to the respondents. The sampling technique used in this study is a samplingmethod that is incidental sampling technique based on chance, that anyone who accidentally/incidentally met with investigators can be used as a sample, when viewed people who happen to encounter it suitable as a data source Further data collection and statistical analysis.

Results and Discussion

Result: The result were based upon the data capture from 200 patients. The prevalence of self-medication was reported as percentages. Of the 215 questionnaires distributed, 200 (93.00%) were answered and the rest were probably ignored by the patients and noticed a certain difficulty in answering.

Discussion

According to the demographic of the respondent characteristic, distribution of respondents by gender can be seen in Table 1. The majority of respondents were female as much as 128 respondents (64%), while male respondents as much as 72 respondents (36%). Distribution of respondents by age of the respondents is shown in Table 2. The majority of respondents were in the age group of 21-30 years as many as 64 respondents (32%) and the 61-70 age group are in the minority as much as 11 respondents (6%). This is due to the majority of people who visit the city of Makassar pharmacies that are in the age range 21-30 years. Distribution of respondents by education level of respondents can be seen in Table 3. The majority of respondents are at the level of high school education/equivalent as much as 111 respondents (55.5%). Based on the data obtained in table 3., the visitors pharmacies mostly work as a student and a housewife who had high school/equivalent.

The results of analysis based on long-term use OTC analgesics on the respondents as shown in Table 4. shows 57 respondents (28.5%) Long-term use of analgesics. Anti-inflammatory steroids used in high doses and for a long period can cause serious side effects on the gastrointestinal tract. In the stomach, COX - 1 produces prostaglandin (PGE2 and PGI2) that take action to keep the gastric mucosa. Nonselective NSAIDs inhibit COX-1 and COX-2, because of these NSAIDs reduce prostaglandin cytoprotective effects, these drugs often cause serious side effects in the upper gastrointestinal, including GI bleeding and ulcer. NSAIDs also likely to cause nephrotoxic. This is due to prostaglandin PGE2 and PGI2 is a powerful vasodilator involved in the control of renal blood flow and excretion of salt and water. Inhibition of renal prostaglandin synthesis may cause sodium retention, decreased renal blood flow and renal failure, especially in patients with conditions associated with catecholamine release vasocontrictor and angiotensin II (eg, congestive heart failure, cirrhosis). In addition, NSAIDs may cause interstitial nephritis and hyperkalemia. Long-term abuse of analgesic for many years associated with papillary necrosis and chronic renal failure.

In Table 4. shows that the majority of respondents often experience headaches as many as 89 respondents (44.5%). According to the results of interviews with respondents, one of the causes of headaches they experienced because of the effect of changes in employment and erratic weather in the city of Makassar lead to headache accompanied by fever (influenza symptoms). In table 5, can be seen the healing of headaches experienced by respondents relieved by taking a generic paracetamol. One cause of many community people using generic paracetamol in pain management because these drugs earlier known to the public. This is according to the data (table 11) that the resources that they get the most from the experience of the family, in other words that they get the information from generation to generation.

The results of the analysis by the parties suggested the respondent to use analgesics can be seen in Table 7. shows the majority of respondents were 86 respondents (43%) get advice from a doctor. This shows that the people of the city of Makassar are increasingly aware of health. If the pain it will go to the doctor and ask for advice from a medical expert for treatment. In addition to asking the advice of medical experts, according to the second largest number of 60 respondents (30%) ask for advice from others in this family. This is because the tribal customs Bugis-Makassar has a sense of high concern among families with each other.

Based on the data obtained 8. tables majority of respondents obtain drug information from the physicians as much as 43 respondents at 21.5%, followed by obtaining information from the family as much as 42 respondents at 21%. This proves that the level of trust in the family is still greater than the trust of the medical experts. But not so significantly different that differ only 0.5%.

In Table 6, data showed that the majority of people taking the drug did not read the brochure first (60.5%). This means that the level of public awareness is still low. This proves the lack of attention from medical experts in providing information about the importance of the rules of use of OTC analgesics. This proves the lack of role and the attention of medical experts in providing information related to the drug. Drugs information service which is the duty of the pharmacist cannot run well. The importance of reading the brochure for the use of OTC analgesic drug that is not in accordance with the rules of use can cause serious side effects.

Data from table 8, which highlighted the role of the pharmacist as a primary source of information that only 12% of drugs. This data is still far from the 21% physician role as a conduit of information medicine. The role of pharmacists simplest is to educate the public so that the drugs appropriately. What is meant here is

how to take the drug if the drug is taken before or after meals, as well as how to give the right. Therefore, as pharmacists, need to convey to the public the importance of reading the brochure for the use of OTC analgesic drug that is not in accordance with the rules of use can cause serious side effects.

Conclusion

Based on the data obtained, it can be concluded that:

1. The level of knowledge about the use of analgesic drugs Makassar city community still low.
2. The role of the pharmacist as a source of drug information providers needs to be improved.

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Effect of Different Levels of Coriandrum Sativum and Piper Nigrum and their Interaction on Production, Biochemical Parameter, Liver Enzymes, TSH and Growth Hormone for Broiler Chickens

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Abstract

This study was conducted in Agri. Faculty field, University of Sumer De-Qar province for period from 10th of April 2019 to 14th of May 2019, they had fed 35 days. The objective of this study was to evaluate the effective of watery extraction of Coriander and Black pepper to (80) chickens, one day old, Strain Rose 308, unsexed birds and breed in four cages of batteries. This experiment was divided into four groups, three treatments with different levels and the fourth as a control. The results showed a significant increase of weekly body weight (BW), as well the treatments were improving feed consumption $P < 0.05$, furthermore there is increase in feed conversion ratio with significant result $P<0.05$. The study reported about biochemical parameters, It showed that a significant decrease in cholesterol and triglyceride (T.G.) $P<0.05$ incompared with the control and no significant difference with total protein. Liver enzymes activity after use medicinal herbs and spice for broiler chicks were recorded a significant reduction in GOT and GPT and no Significant effect on ALP, $P<0.05$. As well as the herbs and spice gave increase in growth hormone maybe that herbs contain mineral and vitamins which increased growth hormones $P<0.05$ the efficient of growth hormone (somatotrophin) was increase protein retention and glycogen deposited in the muscles, as well increase in TSH hormone that gave significant result $P<0.05$. Increased of TSH hormone secrete from pituitary gland and causes elevated in T_3, T_4 and increased the **metabolism.** The result indicated that there is significant differences between treatments for Immunological test of N.D. $P<0.05$ when compared with a control and no significant differences for I.B. test. It is concluded the extraction enhanced the performance and health situation with improvement antibody titer against N.D. but the medicinal herbs did not effect on infection bronchitis (IB) disease as well all the chickens were vaccinated with N.D. and No vaccine with IB.

Keywords: *Coriander seed, spices, Liver enzymes, Growth hormone and chickens Rose 308.*

Introduction

Coriander is an annual, short, fast–growing and prefer dry climates and thrives in well-drained soils. [8] The plant grow up to 1-3 Feet high, the leaves are light green in color. The flowers are white or pink, the stem is green, erect Sympodial, which grow up to the height of 75cm, the plant blooms during late Summer. The plant yield a seed as a fruit. The brownish seed are round ¼ inch long and 6mm as a diameter. The seed possess sweet and orange flavor. Herbs and spices have recently emerged as alternatives to antibiotics in animal production. They are known to exert antimicrobial actions in vitro against important Pathogens including fungi[6]. It has also been reported that plant extracts and spices as single compound or as mixed preparations can play a role in supporting both performance and health status of the animal[17]. About 20 gram of Coriander leaves contains 5 calories 0.73 gram of carbohydrate, 0.19. of Fat, 0.43g of protein, 3% daily value of Vit. B_9 and daily value of Vit. C. It possesses antioxidants such as selenium, Ascorbic acid, Vit. A., Beta-Carotene and Vit. E.[8]

Functions of Coriandrum sativum:

1. Reduce cholesterol. Its possesses oleic acid, Linoleic acid, Stearic acid and ascorbic acid which lower the

level of cholesterol and bad cholesterol in the inner walls of veins and arteries.

2. Prevents anemia: Coriander contains good amount of iron which is helpful for the anemia patients.
3. Anti-allergic activity: Anti-histamine properties in coriander helps to lower the uncomfortable condition caused by hay fever and seasonal allergies.

Black Pepper: Piper Nigrum is a flowering vine extracted from the core of a pepper plant and belongs to the family Piperaceae, genus Piper and spices Piper Nigrum. Black Pepper has been shown to be rich in glutathione peroxidase and glucose-6-phosphate dehydrogenase[13].

The antioxidant and radical scavenging properties of black pepper Seed have been well documented.[9]

[12]:Showed that piperine Can increase the absorption of Selenium, Vit B Complex, beta Carotene and Curcumin as well.

The pepper is a Creeper and normally grown on tall trees and grows up to 4 meter. The pepper we use at home is the dried pepper Fruit, when ripe the pepper fruit is red in color and when dried it becomes black. A tea spoon of pepper which makes about four grams gives as low as (10) Calories and contributes to daily value requirement of about 10% Mn, 5.4% Vit.k, 14.4% Iron 4.9% copper and about 2.8% of dietary fiber, its Promotes production of hydrochloric acid in stomach and improves digestion. Black pepper antioxidant benefits as well established and known to promote good intestinal health. It is help food to stay no longer than required there by reducing stomach gas and irritations. The pipperine seems to increase metabolic reactions to keep the fat levels under control. Black pepper also a good antiseptic, it prevents or reduce temperatures during fever.

Chickens Rose 308: is recognized globally as a broiler that will give consistent performance in broiler house.

Integrated and independent producers value the growth rate, Feed efficiency and robust performance.

Rose 308 is a robust, fast growing, Feed efficient broiler with good meat yield.

It is designed to satisfy the demands of customers who require consistency of performance and the versatility to meat a broad range of end product requirements.

Features of Broilers Rose 308:

1. Rapid growth, the possibility of early Slaughtering.
2. More muscle mass.
3. Bright skin.
4. High performance

Advantages of cross broiler Rose 308

1. Excellent Live weight gain.
2. Large and long legs.
3. Excellent Feed Conversion.
4. White and large breasts.

Materials and Method

The experiment started from 10th of April 2019 to 14th of May 2019 the chickens Fed ad-libitum for 35 days. Its was done in Agri. Faculty Field, Univ. of Sumer, De- Qar/Raifae.

The project divided into four groups, three treatments with different levels and the fourth as a control.

The chickens Rose (308) were distributed randomly for (3) treatments and the fourth as control.

T_1 = Control : just water drank .

T_2 = Coriandrumsativum only 4 mL Ext.COR./Lit. Water.

T_3 = Coriander + Black Pepper 3 mL Ext. COR. + 1 ml Ext. B.P./Lit. water.

T_4= Coriander + Black Pepper 2.5 mL Ext. COR. + 1.5 ml Ext. B.P./Lit. water.

The procedure of extraction: The medicinal herbs plant was brought from popular Market and Mill the seeds by electrical Machine to get Powder, after that it was dissolved with distilled water and left for 24 hours.

The percentage recorded 1g. Powder dissolved with 2ml of distilled water then the solution was kept in water bath on 60C° until boiling then left it to cool and filtered by sterile gauze after that the solution was ready for use.

Statistical Analysis: The statistical computations were done by using SAS Software program (SAS, 2012). Duncan's multiple range test (1955) to comparison between means. (21 and 22).

Results

The study deal with different treatments of herbs on many differ Biological Parameters. It contain (6) tables.

Table 1: Effect of Extraction for medicinal herbs and spices on feed consumption of broiler chickens

C.F.C.	Weekly age					Treat
	5	4	3	2	1	
18.28 ± 3247.40 d	12.35 ± 1560.47 c	5.66 ± 813.33 b	3.49 ± 534.57c	1.67 ± 217.95	1.13 ± 121.08	T_1
16.11 ± 3369.93 c	10.29 ± 1655.58b	6.14 ± 817.05 b	2.95 ± 553.26 b	1.33 ± 223.20	0.96 ± 120.84	T_2
17.83 ± 3460.83 a	11.33 ± 1709.72 a	6.11 ± 838.47 ab	2.77 ± 569.73 ab	1.58 ± 223.79	1.11 ± 119.12	T_3
18.83 ± 3501.07 a	1.33 ± 1717.30a	5.83 ± 855.71 a	3.18 ± 582.96a	1.38 ± 223.94	1.11 ± 121.16	T_4
*	*	*	*	*	N.S	L.s.ig

There is significant decrease in cumulative feed consumption P<0.05 and as well between the treatments,started from third week of the experiment.

Table 2: Effect of extraction for medicinal herbs and spice on feed conversion ratio to broiler chickens.

F.C.R.	Weekly age					Treat
	5	4	3	2	1	
0.012 ± 1.77c	0.022 ± 1.94c	0.016 ± 1.75c	0.013 ± 1.64c	0.011±1.49b	0.008 ± 1.12	T_1
0.011 ± 1.68b	0.017 ± 1.86b	0.014 ± 1.66b	0.011 ± 1.57b	0.010 ± 1.44ab	0.010 ± 1.13	T_2
0.010 ± 1.66ab	0.019 ± 1.84ab	0.017 ± 1.63ab	0.015 ± 1.54ab	0.010 ± 1.43a	0.006 ± 1.12	T_3
0.012 ± 1.63a	0.017 ± 1.80a	0.016 ± 1.61a	0.013 ± 1.50a	0.009 ± 1.40a	0.008 ± 1.13	T_4
*	*	*	*	*	N.S	L.s.ig

This results indicated there is significant P<0.05 on feed conversion ration started from third week of treatments.

Table 3: Shows the comparison between different treatments in Biochemistry.

Treatment	Mean ± SE		
	Cholesterol (mg/dl)	Triglyceride (mg/dl)	Total protein (g/dl)
T1:Control	140.00 ± 8.31 a	55.00 ± 2.58 b	3.30 ± 0.09 a
T2:4 ml/L Coriander	90.00 ± 4.58 b	56.00 ± 2.75 b	3.00 ± 0.06 a
T3: 3ml/L Coriander + 1 ml/L Black pepper	120.00 ± 7.08 a	62.00 ± 3.23 ab	3.20 ± 0.11 a
T4: 2.5ml/L Coriander + 1.5 ml/L Black pepper	135.00 ± 7.43 a	75.00 ± 5.07 a	3.40 ± 0.15 a
Level of sig.	*	*	NS

There is significant reduction p<0.05 for cholesterol and P 0.05 >for T.G and No. Sig. for total protein.

Table 4: Effect of medicinal herbs and spice on Liver enzymes.

Treatment	Mean ± SE		
	GOT	GPT	ALP
T1:Control	52.00 ± 2.51 a	14.00 ± 0.55 a	690.00 ± 24.53 a
T2:4 ml/L Coriander	40.00 ± 1.63 b	10.00 ± 0.37 b	695.00 ± 27.74 a
T3: 3ml/L Coriander + 1 ml/L Black pepper	47.0 ± 2.06 a	9.00 ± 0.41 b	680.00 ± 19.47 a
T4: 2.5ml/L Coriander + 1.5 ml/L Black pepper	49.00 ± 2.37 a	12.00 ± 0.68 ab	680.00 ± 25.04 a
Level of sig.	*	*	NS

The Results showed a significant $p<0.05$ **decrease** in GOT and GPT but there is no significant in ALP.

Table 5: Effect of coriander and black pepper on growth and TSH hormones in broiler chickens.

Treatment	Mean ± SE	
	GH-Growth hormone	TSH
T1:Control	0.10 ± 0.02b	0.20 ± 0.03 a
T2:4 ml/L Coriander	0.10 ± 0.02 b	0.21 ± 0.05 a
T3: 3ml/L Coriander + 1 ml/L Black pepper	0.14 ± 0.05 a	0.11 ± 0.01 b
T4: 2.5ml/L Coriander + 1.5 ml/L Black pepper	0.12 ± 0.02 ab	0.23 ± 0.05 a
Level of sig.	*	*

The result showed a significant increase $p<0.05$ for growth and TSH hormones.

Table 6 :Effect of herbs and spice for Immunity in Broiler chickens.

Treatment	Mean ± SE	
	N.D.	I.B.
T1:Control	1504.00 ± 62.48 b	0.00 ± 0.00 a
T2:4 ml/L Coriander	2281.00 ± 94.53 b	0.00 ± 0.00 a
T3: 3ml/L Coriander + 1 ml/L Black pepper	5825.00 ± 135.09 a	0.00 ± 0.00 a
T4: 2.5ml/L Coriander + 1.5 ml/L Black pepper	6715.00 ± 164.74 a	0.00 ± 0.00 a
Level of sig.	*	NS

There is significant $p<0.05$ for N.D. with different treatments compare with control and No. Sig. with infection bronchitis (IB).

Note: All broiler chickens vaccinated against N.D. only .

Discussion

The study was conducted to assessment the effect of watery extraction of medicinal herbs and spices on weekly Body weight gain (B.W.G.), Feed Consumption (FC.) and Feed conversion ratio (FCR).

Body weight gain (B.W.G.), Feed Consumption (FC.) and Feed conversion ratio (FCR). All treatments significant differences $p<0.05$ compared with control, that study Carried out through Table [1 and 2] These results agreed with author[20] who observed that COR.

Supplementation improved BW., BWG, and FCR. As well author[10] who started that COR. Supplementation at a level of 2% improved B.W.and FCR in Japanese quails.

Author[4] observed that BWG, of male broiler during different weeks was no influenced by (BP) Black Pepper (TUR) Turmeric or their Combination.

From this study we observed improved with Biochemical parameters, the result showed a reduction in cholesterol P<0.05 and increase with T.G. P> 0.05 but no significant with total protein, maybe due to active Fatty acid such as oleic acid palmitic acid and essential oils such as Linalool that Lowered cholesterol by hepatocytes. Table 3.

The study showed that a significant reduction for two enzymes of the liver GOT and GPT P<0.05 Compare with the controland no significant with ALP enzyme. Table 4. that medicinal herbs and spice maybecontribute to decrease liver damage.

The resultunagreed with author [18] who observed that TUR supplementation alone was not significant with total cholesterol.

Present study indicated that growth and TSH hormones had significant increased p<0.05 compare with the control.

Growth hormone are protein and contribute to grow the bird to quickly. It is responsible for growth of the body including bones and help for increase metabolic process, as well as TSH hormone are principal hormone responsible for attainment the growth. Table 5.

Result of Table 6 deal with immunity test for chickens treated with different medicinal herbs and spice, and all chickens were vaccinated with N.D. only, and we found a significant differences and increased antibody value against N.D. compare with the control, P<0.05 and no significant antibody against IB. Author [15] observed the chickens immunized with Eimeriaprofilin protein and fed diets supplemented with carvacrolcinamaldehydeand capsicum oleoresin or turmeric oleoresin and capsicum oleoresin had increased body weights and antibody levels compared withunimmunized and infected chickens Feda non Supplementeddiet.

Conclusions

From this project, it is concluded that supplementation of medicinal herbs and spice as watery extraction for Broiler chicken improving Body weight, Body weight gain, Feed Consumption, Feed Conversion ratio and reduction of Biochemical such as cholesterol and as well reduction ofliver enzymes with enhanced the immunity of the birds.

Recommendation: Added medicinal herbs and spice for Broiler chickens enhanced flavor of the Feed and stimulate the digestive enzymes activity that improved B.W., B.W.G., F.C., F.C.R. and reduction the cholesterol, enzymes GOT, GPT.

The Author suggested that used the medicinal herbs and spices contribute for enhance daily body weight gain, gave reduction for liver enzymes and cholesterol as well Author suggest that herbs improving growth and TSH hormones to boost the metabolism and enhance the immunity of the birds .

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Ethical Clearance: The project was approved by the local ethical committee (College of Agriculture, University of Sumer(

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Parental Style and its Relation to Adolescents' Self-Concept and Depression

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Abstract

Background: The adolescents' growth and development can be developed by the style of parents. Parenting style has been discussed to influence on psychological status of adolescent in which it may produce depression or decrease self-concept.

The Aim of the Study: Was to assess parental style and its relation to adolescents' self-concept and depression.

Research Design: descriptive correlation research design was used.

Research Question: Is there a relation between Parental style and adolescents' self-concept and depression?

Setting: This study was carried out in Zohra preparatory and El-Fath preparatory schools at Minia City.

Sampling: A convenient sample consisted of 200 adolescent students.

Tools: Three tools were used; Parental style (MOPS), Self-Concept Clarity Scale, and Birleson depression scale.

Results: There was significant negative statistical correlation between self – concept and total parent style.

Conclusion: The current study concluded that most of the studied adolescent pained from depression symptoms. Parents with abusive behavior their adolescent self-concept decreased and become depressed.

Recommendations: Parents training regarding parenthood had a power on self-concept of their children which as a consequently induced the depression.

Keywords: *Adolescents', Depression, Parental Style, Self-Concept.*

Introduction

The master component of each society and the smallest public unit is the family. As well, the climate of family is the most significant and initial tool that affect the growth of family individuals[(1,2)]. The basic of developing any individual is resting in the family womb; and the family environment as well its atmosphere is the basic for developing and growing the child's personality.

Parenting is sophisticated and multiplex action that encompasses numerous special behaviors as well as it is working autonomously to impact their children outcomes. Parenting contains two major and distinguishing roles as the mothering and fathering[(3)]. Loving, sympathetic, authoritative, legitimate fathering develops the child autonomous, individualistic, and emotional stability as well establishes their positive attitudes and behaviors toward the society. If mother's anticipation is true, having love, and suitable in caring, ascendancy or punishing; the development of child become more gainful, useful and fanciful. While, ideal and exemplary mother expectation, over protection and

more soldiers like mother's attitude can be seen as the responsible for the modes of parenting problems[4].

At times, self-concept has been defined as an individuality characteristic. Modern researches about personality has been displayed that great five personality features (extraversion, neuroticism, agreeableness, conscientiousness, and openness) are essence and root characteristics that cannot be changed. While self-concept realized as the biddable and tractable characteristics of person. These researches had seen self-concept as changeable personality characteristics because it can be affected by status, situations, events of life, and environment factors. Therefore, self-concept considered as multidimensional structure and it has been specified that the causative impact of personality on one behavior and attitude can be more probably interpose to some scope by self-concept [5, 6].

There are many studies concluded that there is a reverse relation between self-concept and depression. By another way when self-concept dwindling, the average of depression will be excessed [7]. revealed in their study that depression and self-concept had correlation; as well as they displayed a comparable correlation for another variable like ethnic/racial group, physical look, and sex in their study. Also, they revealed that adolescents with Hispanic ethic had low self-concept and high depression level than other ethnic categories.

The negative feelings about own bodies were higher between Hispanic females adolescent than White and African American and these feelings were shared in increasing the depression symptoms as well decreasing self-concept. Self-concept, depressed mood, and body image have a mutual distinction between emigrant and acculturated Hispanic girls. As the negative feelings among Hispanic females for their bodies' image may be directed to marginalization outcome[8, 9].

Therefore, depression which is the most widespread status of emotional problems is more practiced during adolescence; it can be described by feelings of anxiety, anger, fear, sadness, guilt, disrespect, grief, chagrin confused or troubled thinking [10, 11]. Personality features can be explicate as the continual characteristics which can discriminate between persons, and some words that can be used to characterize personality are "passive," "extrovert," "outgoing," and others. On the other hand, personality features or traits refer to how the person can reply to events that is temporary[12].

Depression is utilized as a subscale for determining the clinical and nonclinical citizens of children with the behavior disorders[13].There are many aspects of adolescent's life can be influenced by the presence of depression such as, family and social relationships, self-worth, schoolwork, and decision making. Specially, depression can affect negatively different domains of cognitive function in children and adolescents. Thus, inability to treat depression in adolescents, this can lead to a growing in suicides; as the greatest decisive predictor for suicide is depression [14].

Significance of the study: One of most important aspect of individual is self-concept which is a key of psychological luxury that build in and of itself. Also, self-concept had been evident to have an effect on various and many of critical wellbeing results and outcomes and serve as an influential cornerstone for developing full of one's potential. Also, it was reported from various studies that many of individual who have low self-concept had negative or high psychological disorders such a fear, anxiety, stress and depression. Thus this study was done to assess parents' styles and its relation to self-concept and depression.

Aim of the study: To assess parental style and its relation to adolescents' self-concept and depression

Research question: Is there a relation between Parental style and adolescents' self-concept and depression?

Subjects and Method

Research design: Descriptive correlational research design was used in this study.

Setting of the study: This study was conducted at selected sample of Minia schools in (Zohra preparatory school and El-Fathpreparatory schools) at Minia City.

Subjects:

A convenient sample of 200 adolescent their ages ranged from 12 to 16 yrs. students was recruited in the study. Data collection started from March to May 2017.

Tools of data collection: Three tools were used

1. **Tool one** it contained two parts

First part: Personal data, which covered the following items: age, gender, address, and birth order and family income.

Second Part:

1. **Measure of Parental Style (MOPS)[15];** this self-assessment tool used to assess the perceived parenting styles by parents. This tool comprised of 15 items divided into three styles as: Indifference style contained (6 items), Abuse style contained (5 items)and over control contained (4 items). The sum of the style items scores provides the total score for each style. There is no severance of score; the style total score show to which that parental style was dominated by parents.
2. **Self-Concept Clarity Scale [16]:** This scale was used by researcher to assess the self-concept of adolescent. This scale contained 12 statements measured by five points likert scale ranged from (1 strongly disagree to 5 strongly agree). The scoring system was as follow: low self-concept when adolescent is less than 20, from 21 to 40 is moderate and high self-concept is from 41 to 60. The scale statements are reversed items except statement number 6 and 11.

3. **Birleson depression scale[17]:** This scale was utilized by researchers to determine the depression level among adolescents. It encompassed from 18 statements measured by three point likert scale ranged from (0=never to usually=2). Statements are reversed in 3,5,10,14,15,17and 18.Scoring system was the adolescent who had less than 11= is not depressed; and adolescent who had 12 and more are depressed.

Pilot Study: It was applied on 10% from the study subjects (20 adolescents). Based on the pilot study analysis no modifications were done in the questionnaires .So number of the pilot study was included in the total number of the study sample.

Validity and Reliability: The tools were submitted to a panel of five experts in the field of pediatric nursing and psychiatric nursing at Minia and Assuit University to confirm content validity. Reliability of the tools were done and calculated statistically. The reliability of tools was measured by Cronbach's alpha test and was for tool I (0.87), for tool II (0.90)and for tool III (0.89).

Procedure: A review of related literature was done for covering various aspects of the problem using available journals and books to be acquainted with the research problem and to select the appropriate study tools. Official permissions were granted from the director of schools to conduct the study. The researcher selects these two schools because only these schools agree to participate in the study. The researchers went to El-Fath preparatory school every Sunday from 9am to 11 am and take adolescents in lab room then explain the purpose of the study and then fill in the sheet. Regarding Zohraschoole, it's a village affiliated to Minia city, the researcher went to it by bus, the researchers went to Zohra preparatory school every Wednesday from 9am to 11 am, and the aim of the study was explained by the researcher to adolescents for getting their approval prior starting their participation in the study. The data collection was lasted for three months. Their ages were ranged between 12- 16 yrs, majority of them in class 3 preparatory school, their number was 200 who agreed to participate in the study.

Statistical Analysis: Subjects' responses to each category were analyzed, categorized and coded by investigators then tabulated separately by using the statistical package for social science (SPSS) version 20. Descriptive statistics were calculated as frequency, percentage, mean, stander deviation. T-test and ANOVA test and Pearson correlation were also used among studied values. Probability (p-value) less than 0.05 is considered significant and less than 0.001 is considered highly significant.

Results

Table (1): Distribution of the studied adolescent according to socio-demographic data, shows that, more than two thirds of the study adolescents (68.5%) aged between 14- 16year, with mean age (13.73 ± 0.95). Regarding gender, about three quarter (73%) of adolescents were females and (27%) of them were male. 50.5% of adolescences live in urban area. 50% of adolescences have low family income. Also, it reveals that, the highest percentage of adolescent (36.5%) was ranked as second child in their families.

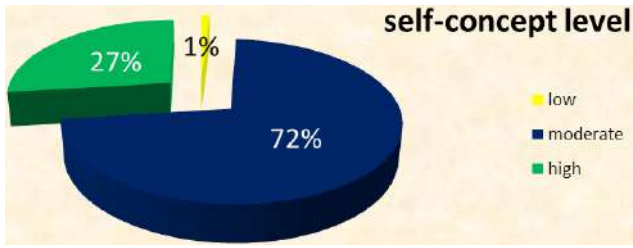

Figure 1: Distribution of Studied adolescent According their self-Concept levels (n= 200).

Figure (1) shows that most of adolescent 72% had moderate self –concept level and more than on quarter 27% had high self-concept level.

Figure 2: Distribution of Studied adolescent According to Presences of depression symptoms (n= 200)

Figure (2) clarifies that the vast majority 98% of studied adolescent suffered from depression symptoms, but only 2% of them not suffered from depression.

As regardmean Score differences of adolescents' Parent style, Self- concept and Depression, According to gender, result shows that, there was statistically significant difference between total parent style and adolescent gender (t=0.96, P=0.03).

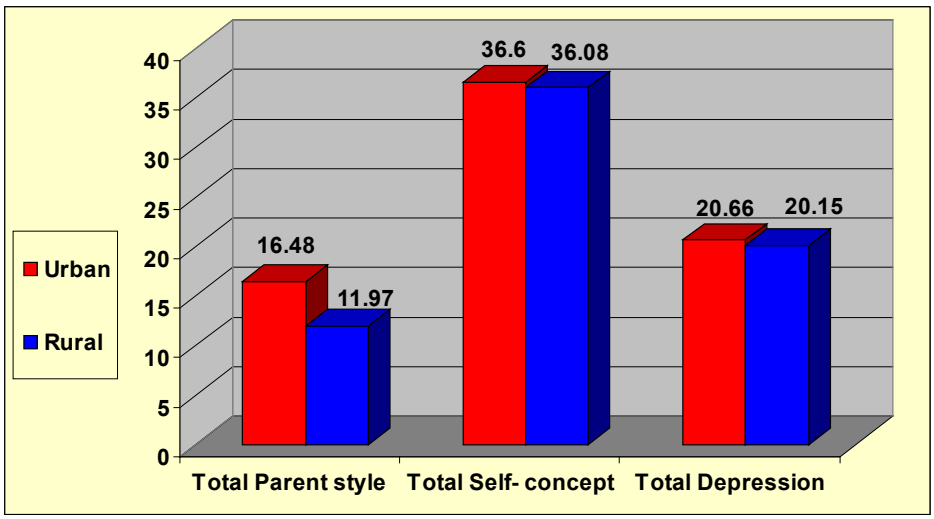

Figure 3: Mean Scores differences of adolescents' Parent style, Self- concept and Depression, According to place of residence (n=200)

Figure (3) shows that, there was statistically significant difference between total parent style as well as total self-concept with place of residence (t=5.01, p=0.00** and t=0.66, p=0.02**) respectively.

Table (1): Relation between adolescents' gender and both depression and self- concept levels (n=200)

Tested Items	Total	Male		Female		X^2 P-value
		No.	%	No.	%	
Level of depression						
• Nnormal non- depressed "less than 11"	5	1	0.5	3	1.5	0.96
• Ddepressed"12 - and more"	195	53	26.5	143	71.5	0.00**
Level of self- concept						
• Llow "≥ 20"	1	1	0.5	0	0.0	2.76
• Mmoderate "21-40"	145	38	19	107	53.5	0.25
• Hhigh "41-60"	54	15	7.5	39	19.5	

Table 1 clarifies that there were 71.5% of female adolescents suffering from depression compared with 26.5% of male adolescents with statistically significant difference between the two groups (X^2 = 0.96/p-value 0.00). Additionally, 53.5% of female adolescents had moderate level of self-concept and no one had high level; compared with 19% had moderate self-concept level and 7.5% had high level among male adolescent with not significant statistically difference between the two groups.

Also, results display that the highest mean scores "16.25 ± 8.09" of total parent style score and its' domains; indifference parent style and over control

parent style "6.00 ± 3.74" and "7.00 ± 2.58" were reported by adolescent's who don't have depression symptoms. Also, it can be noted that the highest mean score was "4.41 ± 3.21" of abuse parent style reported by adolescent's who had depression symptoms.

Table (2): Correlation between Adolescents' Perceived Parent Style and both of self- concept and depression

Variables		Total Parent Style	parent style domain 1	parent style domain 2	parent style domain 3	Total depression	Total Self concept
Total Parent Style	R P-value	1					
Parent style domain 1	R P-value	0.855** 0.000	1 -				
Parent style domain 2	R P-value	0.842** 0.000	0.610** 0.000	1 -	.		
Parent style domain 3	R P-value	0.436** 0.00	0.098 0.166	0.121 .074	1 -		
Total depression	R P-value	-0.146-* 0.039	-0.166 0.019	-0.074 0.300	-0.069 0.332	1 -	
Total Self concept	R P-value	-0.174-* 0.014	-0.123- 0.083	-0.195- **0.006	-0.047- 0.509	0.296** 0.00	1 -

Table 2: Shows that there were statistically significant negative correlations between self – concept and total parent style and its subscale of abuse parent style (R=-0.17, p- value 0.01) & (R=-0.19, p- value 0.00) respectively. Additionally there was a statistically significant negative correlation between depression score and total parent style & Parent Indifference style (R= - 0.14, p- value 0.03) & (R= -0.16 p- value 0.00) respectively.

Discussion

The current study revealed that there was more than two thirds (68.5%) of the adolescents aged between 14-16 year, while there was 31.5% of them had age between 12- < 14 year, with mean age of 13.73 ± 0.95. Regarding gender, there was 73% of adolescents were female and 27% of them were male. Also data revealed that, the highest percentage of adolescent 36.5% ranked the second child in their families.

The current study displayed that most of adolescent 72% had moderate self -concept and more than a quarter 27% had high self –concept. The vast majority 98% of studied adolescent suffered from symptoms of depression, but there only 2% had no experiences or symptoms of depression according to Birleson depression scale. As the adolescent who has low level of self-concept, was in risk to be depressed. This can be explained as result of the strong relation between self-concept and depression.

Actually when there is a support provided from parents and peers to the adolescents, their self-concept will be enhanced and maintained. In the same respect, [18]displayed that there 56% of their studied adolescents had an average level of self-concept and about third 30.75% had good level of self-concept, 8.25% had poor self-concept, and 0.75% had very poor self-concept, while only 4.25 had very good level of self-concept. Thus, it can be consummated that low level of self-concept is linked to the high level of depression; in other words, when the level of self-concept diminished, the level of depression rates excessed. Also, [5]stated in their research study among 77 adolescents, that there was strong negative correlation founded between depression level and self-concept level.

Moreover, in the current study it was revealed that there were statistical significant differences between male and female adolescents in regarding to the perceived parent style. It was noted that the highest mean scores were for the indifference and abusive parent style

"4.22 ± 3.20"and "4.60 ± 2.99" respectively in favor to female adolescent. While, the highest mean score "6.59 ± 2.53" of over control parent style was reported by male adolescent. This result was in agreement with the findings of [19]who displayed that there are two parent styles as indifference and abusive had significant relation with level of depression among adolescents. Also, the result advocates the hypothesis about the significant relation between parent styles and level of depression in adolescents.

It also observed that there were 71.5% of female adolescents had high level of depression compared with 26.5% of male adolescent; indeed 53.5% of female adolescent had moderate self-concept. This result was congruent with the study result of [12]revealed that, the most commonly psychological disturbance among adolescent was depression, in which it was appear that up to one of each three girls and one out of each five boys can had minimally one episode of depression disorder when reach the age of eighteen.

In the same context [20]supposed that the adolescents with high depression level had self-concept with negative view, which can affect negatively on their cognitive capabilities and had an effect on academic ability. Also, this result was consistent with the findings of [21] found that the level of depression is higher and raised more among female (35%) than male (23.1%) adolescent. As well as it was reported that the incidence of depression symptoms is higher in women than in men[22, 23]. Also, in 2010 the annual global incidence of depression mentioned that depression was 5.5% in female and 3.2% in male[24].

The current study also revealed that the highest mean score was "4.41 ± 3.21" for the abuse parent style which was reported by adolescent's who had depression symptoms. [25]Reported that; adolescents with manifestation of depression had the higher mean score for the abuse parent style. Also, [26]mentioned that the abuse parent style was the most common style reported among adolescents who had symptoms of depression.

Moreover, it was reported from different researches that the mostly effective aspect that influence on the establishment and enhancing personality of adolescent was the parents' activities in parenting. Style of parent's parenting can determine the prosperity or dud of the adolescent. The most important issues in parenting style were; the amount of emotion, softness and smoothness that children had; also, the amount of agreement, conformity and monitoring or dominance that utilized by parents[27].

The current study also revealed that, there were statistically significant negative correlations between self – concept and total parent style & its subscale of abuse parent style. As when abusive behavior increases as a parent style, the self-concept of adolescents decreases consequently. The negative self-concept among adolescent can lead them to do not good during their life. Commonly, they not successes in their life as they often do problems and turmoil in their life; as well as they failed to manage effectively their life.

Therefore, the persons who had negative or low self-concept can absolutely be unsatisfied about them in everything as well they cannot be happy about the surrounding. Further [28]agreed that one who has self-concept in negative manner can be easily and permanently gain criticism from the parents, teachers, peers, and friends. This can help adolescent to be further unfavorable and passive, as well they don't realize how to have relations with people who live with; in which this can influenced and effect on them to be more less self-confidence and timid.

Additionally, there were statistically significant positive correlations between depression score and total parent style & parent indifference style. This result was in congruence with the finding of[29] who pointed that, there was negative relation with statistically significance between the parenting style and adolescents' self-concept in favor to indifference style.

Indeed, correlation between adolescents' self-concept and parenting style did not show any statistically significant relations with all the three dimensions. This was not congruence with[27] mentioned that, parenting styles had statistically significant correlation with depression. As there were two styles of parenting had significance correlation; and the parenting style of authoritarian was the most one had positive correlation, while parenting style of permissive was correlated negatively with depression.

It also, found that there was a statistically significant relation between total depression and total self-concept. This finding was in accordance with the finding of[12] displayed that, there was a strong relation with significance between self-concept and depression.

Conclusion

The parents' style has crucial role in shaping their children behaviors, attitudes and outcomes. Therefore, when the abusive behavior increased due to parent style the self-concept of adolescents decreases consequently

Recommendations: According to the findings of the present study, the relation between depression and parenting style is actually significant. Thus, it is recommended that the training of parents for parenthood can influence their children self-concept which has adverse effect on depression. As well there should be suitable attention given to adolescents, as when they have the necessary assistance and proper feelings and emotions they can be more self-concept and be less depressed.

Source of Funding: Self-funding

Conflict of Interest: Nil

Ethical Clearance: An official permission was obtained from the directors of the two schools after explaining the nature of the work. Also, an official permission was obtained from the ethical committee in faculty after explaining the nature of the work, and then the study aim was explored for every interviewed adolescent (males & females). An ethical right to agree or refuse participation in the study was granted to the adolescent. They informed that their information will kept confidential and used only for the purpose of the study and there was no harm for their participation.

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Assessment of Exam-related Anxiety among the Students of the High Healthy Vocations Institute at Medical City

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Abstract

The purpose of this study was to assess levels of anxiety among the Students of the High Healthy Vocations Institute, to find out relationship between students' anxiety levels and some socio-demographic characteristics such as (age, residency, marital status and department) of the Students of the High Healthy Vocations Institute. The period of the study was from April 2nd, 2019 to June 2nd, 2019). To meet the study objectives a questionnaire was constructed. This questionnaire consisted of two parts: the first part includes four demographic characteristics: age, residency, marital status, and department; the second part concerning with the test anxiety scale. The scale measures the most important symptoms that characterize the test anxiety. Data were analyzed by applying: descriptive statistical analysis: frequencies and percentages and distribution; and inferential analysis: Correlation Coefficient, Chi-squire. The findings of the study revealed that assessment of exam-related anxiety among the Students of the High Healthy Vocations Institute is moderately to severe level of anxiety. There was a significant relationship between severity of anxiety and age of the students. The present study recommends encouraging the students to learn some coping strategies and stress managements by attending training and relaxation sessions. Advice to regular recreational programs that include trips to reduce stress and to help them to prevent and lessen the stress associated with every-day life events stress.

Keywords: *Exam-Related Anxiety;High Healthy Students; Contributing Factors.*

Introduction

Anxiety is an unpleasant state characterized by feelings of tension and apprehension, worrisome thoughts and the activation of the autonomic nervous system when an individual faces evaluative achievement demanding situations[(1)]. Fear of exams and test situations is widespread and appears to become more prevalent and test anxiety has a negative detrimental effect on test performance[(2)]. If an examination particularly affects the person's carrier selection and future opportunities, it may be stressful. Exam anxiety prevalence has been reported as 10-41% in school aged children. Researchers have estimated test anxiety prevalence rates of between 15-20% for college students[(3)]. Exam anxiety is primarily a concern over negative evaluation, so defined as a subtype of social phobia in DSM diagnostic system. Many studies have reported an association between exam anxiety and anxiety disorders[(4-5)]. Psychological factors which contribute significantly to exam anxiety are negative and irrational thinking about exams, outcomes of exams and feelings of no control over exam situation (e.g., going blank during exam) are reported by many authors[(6)]. Higher anxiety levels in the student community are considered as important indicators for poor mental health[(7)]. The potential negative effects of emotional distress on students include impairment of functioning in classroom performance and clinical practice, stress-induced disorders and deteriorating performance[(8)]. Students in extreme stress need serious attention, otherwise inability to cope successfully with

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the enormous stress of education may lead to a cascade of consequences at both personal and professional[9]. Moreover, studies suggest that test anxiety comprises of many negative effects such as low enthusiasm, poor performance, negative self-evaluation viewpoints and low concentration[10-11]. Researches on examination anxiety have the notion that examination anxiety prepares threats for higher institution students. Anxiety symptoms are distributed along a continuum and different symptom levels of anxiety and predict outcomes. Responses consisted of increase heart rate, stress hormone secretion, restlessness, vigilance and fear of potential dangerous environments. Anxiety prepares the body for physical, cognitive and behavioral instincts to detect and deal with threats to students examination survival and then result to students, beginning to be hyperventilate to allow more oxygen to enter into the blood-stream, divert blood to muscles and sweat to cool the skin[12]. Posited that the difference between generalized anxiety disorders and examination anxiety. He explained that general anxiety disorders are characterized by trait anxiety that results to students experiencing higher levels of stresses across a wide range of situations. Contrarily, students that are prone to examination anxiety have a state of anxiety that results to higher levels of nervousness that are specific to examinations. The symptoms of examination anxiety range from moderate to severe anxiety. Students who exhibit moderate symptoms are able to perform relatively well on examinations. On the other hand, students with severe anxiety experience panic[13]; the common physical symptoms include: headache, upset stomach, feeling of fear, feeling of dread, shortness of breath, sweating, pacing or fidgeting, crying, acing thoughts and blanking out. Lyness explained that during the state of excitement or stress, the body releases adrenaline [14]. Adrenaline is known to cause physical symptoms that accompany examination anxiety such as increased heart beat-rate, sweating and rapid-breathing. In many cases, adrenaline is good; it is helpful when dealing with stressful situations, ensuring alertness and preparation. But to some students, the symptoms are difficult or impossible to handle, making them impossible to focus on examinations. The topic of test anxiety has prospered, in part, due to the increasing personal importance of test situations for people inmodern society, making tests and their long-term consequences significant educational, social, and clinical problems formany. Since test results in most academic and occupational settings have important practical implications for a person's goals and future career, test anxiety is frequently reported to be a meaningful factor impacting upon test scores. This study aims to (1) assess levels of anxiety among the students of the High Healthy Vocations Institute; (2) find out relationship between students' anxiety levels and some sociodemographic characteristics such as (age, residency, marital status and department) of these students.

Method

A descriptive analytical design study is applied to assess the anxiety among the students of the high healthy vocation institute at Medical City. The period of the study was from April 2nd, 2019 to June 2nd, 2019. The study included a probability (Stratified random) sample of 70 students. To meet the study objectives a questionnaire was constructed. This questionnaire consisted of two parts: the first part includes the demographic characteristics ofage, residency, marital status, and department; the second part concerning the Sarason test anxiety Scale [16] of 38 item self-report scale that assesses all symptoms of test anxiety. The scale encompasses four domains, each item of scale was rated (1= never, 2= rarely, 3= sometimes, 4= always). By applying the descriptive data analysis of Quartiles which determine the cut-off-points for the levels of anxiety which are Mild (38-103), moderate (104-115, (severe (116-148). Reliability of the questionnaire was determined through pilot study and validity determined through a panel of experts consists of (11) experts. Data were analyzed by applying descriptive statistical (frequencies, percentages) and inferential statistical (Correlation Coefficient and Chi-squire) through the SPSS (Statistical package for Social Sciences) version 21.0.

Results

Table 1: Participants' sociodemographic characteristics

Age		
Year	**Frequency**	**Percent**
≤ 9	19	12.2**%**
20-24	37	23.7**%**
25-29	7	4.5**%**
30-34	2	1.3**%**
35-39	2	1.3**%**
≥40	3	1.9**%**
Total	**70**	**100.0%**

Residency		
Residency		
Baghdad	60	38.5**%**
Outside Baghdad	10	6.4**%**
Total	**70**	**100.0%**
Marital Status		
Marital Status		
Unmarried	60	38.5**%**
Married	10	6.4**%**
Total	**70**	**100.0%**

Department		
Department		
Nursing	40	25.6**%**
Midwifery	15	9.6**%**
Anesthesiology	10	6.4**%**
Emergency	5	3.2**%**
Total	**70**	**100.0%**

Most of the study sample 23.7% are of age 20-24-years, the highest percentage (38.5%) live in Baghdad, more than half (38.5**%)**are single, and the highest percentage (25.6**%)** are from the nursing students.

Table 2. Participants' levels of anxiety

Total No.	Levels of Anxiety							
	Mild		Moderate		Severe		Total	
	F	%	F	%	f	%	F	%
	35	22.4%	16	10.3%	19	12.2%	70	100.0%

There is different severity of Anxiety the students inflicted with; 22.4% have mild level; 10.3% have moderate level and 12.2%with severe level of Anxiety.

Table 3. Distribution of the sample according to the levels of Anxiety

			Levels of Anxiety			Total
			Mild	Moderate	Severe	
Age	≤ 19	F	11	4	4	19
		%	15.7%	5.7%	5.7%	27.1%
	20-24	F	18	6	13	37
		%	25.7%	8.6%	18.6%	52.9%
	25-29	F	3	3	1	7
		%	4.3%	4.3%	1.4%	10.0%
	30-34	F	2	0	0	2
		%	2.9%	0.0%	0.0%	2.9%
	35-39	F	1	1	0	2
		%	1.4%	1.4%	0.0%	2.9%
	≥ 40	F	0	2	1	3
		%	0.0%	2.9%	1.4%	4.3%
Total		**F**	**35**	**16**	**19**	**70**
		%	**50.0%**	**22.9%**	**27.1%**	**100.0%**

Less than a fifth(18.6%) of the age group 20-24 have severe level of Anxiety while just 1.4% of age groups 35-39 have mild level of Anxiety.

Table 4. Levels of Anxiety according to residency of the students participated

			Levels of Anxiety			Total
			Mild	Moderate	Severe	
Residency	Baghdad	F	32	14	14	60
		%	45.7%	20.0%	20.0%	85.7%
	Out Baghdad	F	3	2	5	10
		%	4.3%	2.9%	7.1%	14.3%
Total		**F**	**35**	**16**	**19**	**70**
		%	**50.0%**	**22.9%**	**27.1%**	**100.0%**

A fifth (20.0%) of the students who live in Baghdad have severe level of Anxiety while just 4.3% of students are living outside Baghdad have mild level of Anxiety.

Table 5. Participants' levels of Anxiety according to the marital status

			Levels of Anxiety			Total
			Mild	Moderate	Severe	
Marital Status	Unmarried	F	32	14	14	60
		%	45.7%	20.0%	20.0%	85.7%
	Married	F	3	2	5	10
		%	4.3%	2.9%	7.1%	14.3%
Total		**F**	**35**	**16**	**19**	**70**
		%	**50.0%**	**22.9%**	**27.1%**	**100.0%**

A fifth (20.0%) of the students group unmarried has severe level of Anxiety while just 4.3% of the married students have mild level of Anxiety.

Discussion

The most important consequence of this study is that the results of table (2) show that the students have different levels of anxiety. This result is supported by Clark and her colleagues (2000) found that the majority of subjects had high levels of test anxiety, as can be inferred from the results of the present study, the high and moderate levels of anxiety are higher than those of studies cited above. This difference may be due to several factors that have an impact on anxiety, such as different course contents, educational environment, test conditions, types of test questions and other factors[17].

The results show that the students are young and being around eighteen years old and of mid- aged and being around forty years old and have different levels of anxiety table (3). In addition, the age groups of (20-24) have more levels of anxiety (52.9%). This result is supported by McDonald (2001); Showed that fear of failing a test increased with age in American and Australian students, in studies that use specific test anxiety scales, anxiety levels typically increase with age, found that test anxiety levels increase through in younger and middle-aged students[18].

The study indicates that the students living in the City of Baghdad have more levels of anxiety 85.7% than the students living in the outside Baghdad table (4). This might be due to the long way those students need to reach to the institute everyday, but the other students live in places around the institute.

Regarding the marital status, this study shows that 85.7% of unmarried female students have more levels of anxiety Table (5). This is supported by Amuda and colleaguesinvestigated the relationship between marital status and test anxiety, academic performance of undergraduate students in the USA, the result showed that the single students more anxiety than married students. This means that marital status influences students' academic achievement and those that are married tend to do better than the single students[19].

Conclusion

The results of present study indicated that most of the students jointed in the study are of age twentieth

and twenty-four; about half of them live in Baghdad; more than half are unmarried; and most of them are of the nursing department students. The study indicates that high percentage of those students have anxiety in different levels; about a quarter of them are with mild level, less than the quarter are with moderate level, and a twelve of the sample have severe level of anxiety. The study describes statistically significant association between age and severity of anxiety.

Recommendations:

The researchers recommend the following:

1. The teachers should acknowledge the existence of test anxiety on the part of students and should take initiatives for its effective reduction. They should identify individuals with signs of stress and anxiety and should apply appropriate strategies to help them counteract these feelings.
2. Teachers should initiate discussions in the class about the feelings of anxiety and should take measures to reduce the sense of competition among them.
3. There should be some specific teachers training courses on managing test anxiety in order to make teachers aware of this complex issue and, hence, alleviate it.
4. Students should seek counselling before doing tests so as to increase their confidence.
5. Building on 2 above, group counselling sessions may be more beneficial. Such sessions enable students to share their personal experiences and copes strategies with others so that they know that they are not alone.

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Ethical Clearance: A permission to conduct this study was obtained from the ethical committee in the College of Nursing, University of Tikrit.

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Urinary Intestinal Fatty Acid Binding Protein "IFABP" as a Marker for Gut Maturation in Preterm Babies

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Abstract:

Objective: Formula-fed premature babies have a higher incidence of developing necrotizing enterocolitis (NEC) than breast-fed babies which may be caused by breast milk induced gut maturation. The effect of breast milk on maturation of the gut has been widely studied in animal models and recently in humans.

The aim of this study is to evaluate the effects of breast-feeding on maturation of the intestine in premature babies by measuring the postnatal values of a specific enterocyte marker which is urinary intestinal fatty acid binding protein (I-FABP).

Method: Maturation of the gut was studied in 60 premature babies (<37 weeks of gestation) without gastrointestinal morbidity. 30 of them were exclusively breast-fed and the other 30 were formula-fed. Urinary I-FABP levels as the measure of gut maturation were measured at 7th, 12th, and 22nd post-natal days.

Results: In breast-fed babies, there was a statistically significant increase in urinary I-FABP levels between 7th and 12th days after birth compared with formula-fed babies ($p< 0.01$)

Conclusions: The pattern of postnatal changes in urinary I-FABP levels suggests a delayed physiological response causing significantly delayed gut maturation in formula-fed babies compared with breast-fed ones.

Keywords: *Breast-feeding, formula feeding, intestinal fatty acid binding protein,gut maturation, mucosal damage, necrotizing enterocolitis.*

Introduction

Human milk (HM; milk from the infant's own mother) feedings during the Neonatal Intensive Care Unit(NICU) hospitalization reduce the risk of prematurity-related morbidities in a dose-response manner for very low birth weight babies.(1)

These morbidities include late onset sepsis, necrotizing enterocolitis, chronic lung disease, retinopathy of prematurity, prolonged NICU hospitalization, increased health care costs, and long-term health and educational problems.(2)

Breast milk is a known source of molecules that act synergistically to protect the gut barrier and enhance the maturation of the gut-related immune response. So During the perinatal period, nutrition is the principal contributor for immunological and metabolic development, and microbiological programming.(3)

Breast milk is the gold standard for preterm nutrition and influences the development of intestinal microbiota and immune system through its bioactive components.(4)

Preterm infants altered gut microbiota interaction(2) with an immature immunologic intestinal response triggers proinflammatory and counter-inflammatory cytokine response. Necrotizing enterocolitis (NEC) is

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the most common gastro- intestinal emergency in the neonatal intensive care unit (NICU) which is due to excessive inflammatory response against commensal bacteria by the immature intestine following mucosal injury in the postnatal period. (5)

Its prevalence is largely related to birth weight and gestational age (G.A.)with approximately 1 in 10 very low birth weight infants (<1500 g) developing NEC.(5)

Breast-fed newborns are protected against NEC development through improved gut maturation and because there is an estimated 3 to 10 folds risk reduction in infants fed with breast milk compared with those fed with formula milk(6)

Patients and Method

Sixty preterm babies were enrolled in this study, thirty of them were breast-fed preterm babies (Group I) while the other thirty newborns were formula-fed ones (Group II).

All of the babies admitted to the NICU of the Minya University Hospital of children between August 2015 and March 2016 were eligible for participation.

Patients were included if they met the following inclusion criteria: <37 weeks of gestation, first enteral feeding within 7 days after birth, and diet consisting of either exclusively breast milk or exclusively formula milk. The only exclusion criterion was development of significant gastrointestinal pathology during the 30-day study period, defined as disease of the gastrointestinal tract necessitating surgery, antibiotic treatment, cardiopulmonary support, or discontinuation or reduction of enteral feeding.

Initiation of feeding and advancement of feeding volumes were realized according to the local protocol. The standard guidelines consisted of early initiation of oral feeding within few days after birth depending on the infant's gestational age and general condition.

Feeding volume was increased gradually and discontinued if there were signs of feeding intolerance including bilious gastric retentions, abdominal distention, emesis, or bloody stools.

Sample Collection:

1. **Blood samples:** 5 ml of venous blood samples were taken for complete blood count, Total and direct bilirubin, and CRP using fully automated chemical auto-analyzer Dimension-ES, USA.
2. **Urine samples:** Urine samples were collected on the 7th, 12 th, and 22th day after birth.

Samples were collected either from a urine bag connected to an indwelling catheter or from a cotton wool swab placed in the diaper and squeezed through a syringe barrel into a collection tube. Samples were then frozen at -20°C till the time of analysis.

Urinary I-FABP levels were measured by ELISA.

Statistical Analysis: The numerical data were presented as means–standard deviations while non numerical data were presented as percentage. Two tailed-tests were used to analyze differences between the two groups.

P-values less than 0.05 were considered statistically significant. The magnitude of correlations was determined by Pearson's correlation coefficient.

All the data were analyzed by statistical package Prism 3.0 (GraphPad software, SanDiego, CA, USA). Figures were done by Microsoft Office Excel 2007

Results

In the present study, there was a significant statistical difference between breast-fed and formula-fed preterm babies regarding Duration of NICU admission in days ($p< 0.01$**) which was higher in formula-fed preterm babies compared to breast-fed ones,while there was no significant statistical difference between the two groups of patients regarding gestational age (mean±SD33.1 ± 2.2, 32.9 ± 2.1 respectively), sex ($p< 0.01$), and birth weight (mean±SD 0.9 ± 0.7,0.1 ± 0.6,-0.97 ± 0.4 respectively).p ($p< 0.01$ *(Table 1)*.

There was significant higher incidence of Co-morbidities like respiratory distress and sepsis in formula-fed preterm babies compared to breast-fed ones ($p< 0.01$) for both. Seventy three percent of obese children 26.3% of overweight ones were having NAFLD. *(Table2)*

Regarding Signs of feeding intolerance between groups in the form of stopping of feeding, their frequency, and duration, all were significantly higher in in formula-fed preterm babies compared to breast-fed ones ($p< 0.01$) for all. Serum platelets were compared to healthy ones (mean±SD for ALT 71.3 ± 21.4, 41.3 ± 19.1, 30.3 ± 4.4 and Serum TLC(mean±SD for AST

69.8 ± 24.5,36.8 ± 5.5, 30.0 ± 4.4 respectively) (p< 0.01 and 0.05 respectively).staff CRP mean±SD for AST 69.8 ± 24.5,36.8 ± 5.5, 30.0 ± 4.4 respectively) (p< 0.01 *(Table 3)*.

There was negative correlation between BMI,weight, cholesterol, TG and ALT and serum visfatin levels. (p<0.01 for all). *(Table 4)*.

Table (1): Demographic data between groups

Variable		Group (I) Breast fed babies (n=30)	Group (II) Formula fed babies (n=30)	P. value (Sig.)
Gestational age (wks.)		33.1 ± 2.2(29-36)	32.9 ± 2.1(29-36)	0.71^{NS}
Sex	Male	12 (40.0%)	14 (46.7%)	0.60^{NS}
	Female	18 (60.0%)	16 (53.3%)	
Birth weight (gm)		1973 ± 273(1400-2400)	1955 ± 337(1450-2700)	0.88^{NS}
Duration of NICU admission (days)		22.1 ± 4.3	26.0 ± 4.8	< 0.01**

Table (2): Signs of feeding intolerance between groups

Variable		Group (I) Breast fed babies (n=30)	Group (II) Formula fed babies (n=30)	P. value (Sig.)
Stop feeding	No	21 (70.0%)	8 (26.7%)	< 0.01**
	Yes	9 (30.0%)	22 (73.3%)	
No. of episodes		0.63 ± 1.06 (0-3)	1.83 ± 1.53 (0-5)	< 0.01**
Duration of episodes (days)		0.83 ± 1.48 (0-5)	1.90 ± 1.54 (0-5)	< 0.01**
Abd. X-ray findings for intolerance	Negative	30 (100.%)	22 (73.3%)	< 0.01**
	Positive	0	8 (26.7%)	

Table (3): Laboratory data between groups

Variable		Group (I) Breast fed (n=30) (M ± SD)	Group (II) Formula fed (n=30) (M ± SD)	P. value (Sig.)
Hb (g/dl)		17.4 ± 2.21	17.3 ± 2.20	0.83^{NS}
TLC (10^9/L)		10.52 ± 4.73	13.91 ± 4.25	<0.01**
PLT (10^9/L)		129.4 ± 37.7	97.7 ± 32.4	<0.01**
Total bilirubin (mg/dl)		6.80 ± 2.32	6.83 ± 2.43	0.96^{NS}
Direct bilirubin (mg/dl)		0.60 ± 0.25	0.58 ± 0.24	0.76^{NS}
Staff (%)		1.78 ± 1.68	8.47 ± 4.83	<0.01**
CRP	Negative	21 (70.0%)	7 (23.3%)	<0.01**
	Positive	9 (30.0%)	23 (76.7%)	

Table (4): Comparison between groups regarding IFABP level at different postnatal days.

Variable	Group (I) Breast fed (n=30) (M ± SD)	Group (II) Formula fed (n=30) (M ± SD)	P. value (Sig.)
IFABP (7^{th} day), (ng/l)	3807 ± 319	3040 ± 722	<0.01**
IFABP (12^{th} day), (ng/l)	3999 ± 735	3262 ± 552	<0.01**
IFABP (22^{th} day), (ng/l)	3731 ± 828	3414 ± 942	0.17^{NS}
P. value (Sig.)	0.28^{NS}	0.16^{NS}	-

Discussion

FABPs is a set of widely expressed cytoplasmic proteins with small molecular weight and excellent organ specificity, which are immediately secreted into the systemic circulation upon the damage of cells(7)

As a member of the FABPs family, FABP2, which is a *FABP2* gene encoding protein, accounts for up to 2% of the cytoplasmic proteins in the mature enterocyte, and it is responsible for the intake alongside with the transport of polar lipids like fatty acids from the lumen of the small bowel.(8)

FABP2 is a water soluble cytosolic protein with a small molecular weight of 14-15 kDa, and it is initially located in the mature enterocytes of the small intestine. FABP2 is also named as intestinal-type FABP (I-FABP).(9)

Because of its small molecular size, FABP2 is believed to be delivered to the circulation immediately upon the loss of the integrity of the cell membrane and filtering of the glomerulus with a renal excretion of 28% and a considerable half-life of 11minutes. So, it is supposed to be detectable in urine.(10)

Thus, varying FABP2 expressions in the urine could exactly reflect the severity of the cell damage to the intestinal epithelia, making it possible to use FABP2 as a trustable indicator of the disease progression(11).

This study was carried out to assess the diagnostic utility of the urinary I-FABP levels as a new marker for gut maturation in breast-fed preterm neonates compared to formula-fed ones.

In the present study, breast-fed babies and formula-fed ones showed no significant statistical difference regarding gestational age (p=0.71), sex (p< 0.60)and, birth weight (p< 0.88). These findings agreed with the study of Kostan W2014 who stated that there were no significant differences in GA, birth weight, or sex between the 2 groups; however, there was a trend of lower median GA in the breast-fed group.

Our study shows that Prematurity was the primary reason for admission to the NICU in all of the babies and that the duration of NICU admission in days was higher in formula-fed preterm babies compared to breast-fed ones (p**< 0.01).**

The results of our study show a significant higher incidence of Co-morbidities like respiratory distress and sepsisin formula-fed preterm babies compared to breast-fed ones (p< 0.01) for both . This agrees with the study of (12) who explained the beneficial effects of breast milk and its immunomodulatory and anti-inflammatory effect, and high concentrations of secretory immunoglobulin A, CD14, transforming growth factor-b, erythropoietin, and interleukin-10 in breast milk.

In our study, total volume of enteral feedings was recorded every day to investigate whether the type of feeding correlated with feeding intolerance**.** Feeding intolerance is defined as episodes of discontinuation of enteral feeding or frequency and cumulative amount of gastric retentions.

We found that signs of feeding intolerance including feeding stoppage, number of episodes, and duration of those episodes were significantly higher in in formula-fed preterm babies compared to breast-fed ones (p< 0.01) for all**.** . This could be explained by that early breast milk feedings, especially colostrum, promote the growth,maturation, and protection of the gut epithelial border.

In agreement with our study, (13) explained the mechanisms by which breast-feeding improves intestinal maturation. For example, analogues of growth factors or human milk oligosaccharides. The preterm infant's high need for trophic factors should be taken into account. Added to that, his study underlines the importance of breast milk use in preterm infants.

Our results also agree with the study of (14) who found that human milk feedings have been shown to stimulate healthy gut microflora, reduce intestinal permeability, and interfere with the translocation of bacteria from the gut lumen to the mucosa, and appear to be the most critical as VLBW infants transition from intrauterine (e.g., swallowing amniotic fluid) to extrauterine nutrition in the early post-natal period.

Commercial formulas may have a separate detrimental impact on these processes during these early postnatal exposure periods, via up-regulation of inflammatory processes, GIT epithelial cell toxicity, and other mechanisms.(15)

Ethics approval and consent to participate: The study was conducted according to the declarations of Helsinki and approved from the faculty of medicine scientific committee in Minia University (No: 116-5-2016). Written consents were obtained from patients and/or caregivers.

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Associations between TNF-α and Interleukin-18 and ADIPOQ Gene Polymorphisms in Iraqi Obese Women Patients with Polycystic Ovary Syndrome

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Abstract

Polycystic ovary syndrome has always been an enigma, and it still continues to be. In addition to an ovulatory subfertility, women with PCOS show an increased danger of pregnancy complications, obesity, so the effect of this issue isn't simply constrained to reproductive age, however all through life. A total of (128) samples (50 normal Weight and 78 obese groups). Those samples was collected from the Kamal Al-Samarraie hospital, Ministry-of Health in Baghdad-Iraq from April 2017- August 2017. The aim of this present study to was to detect association from polymorphism ADIPOQ gene (rs12495941) with risk of Polycystic ovary syndrome for Iraqi women patients and compare between ADIPOQ gene of Iraq population with gene bank of NCBI . Examine Interleukin-18(IL-18), Tumor necrosis factor alpha (TNF-α) of Polycystic ovary syndrome Iraqi women patients. TNF-α, and IL-18 showed significantly change ($p<0.05$) in Obese with PCOS and low weight with PCOS groups when comparing with control group. followed by no-significant change ($p>0.05$) when comparing between Obese without PCOS and low weight with PCOS groups, also shows significant change ($p<0.05$) when comparing between low weight with PCOS and control group. The results show substitution three Transition A>G and G>A, six Transversion T>G, T>A, and C>A, showed 98% identified with a standard in Gene Bank from patients group while having 100% identified with a standard in Gene Bank with the control group.

Keywords: *Polycystic ovary syndrome, Interleukin-18 (IL-18), Tumor necrosis factoralpha (TNF-α), ADIPOQ gene.*

Introduction

Polycystic ovary syndrome is the most well-known endocrinopathy influencing reproductive aged women .While some women may present symptomatic and others asymptomatic, it does affect women physically, psychologically, metabolically, endocrinologically and reproductively [(1).] The status was first portrayed in 1935 by the American gynecologists Irving F Stein and Michael L Leventhal, both working at the Department of Obstetrics and Gynecology, Michael Reese Hospital, Chicago, USA from whom its original name of Stein-Leventhal syndrome was taken, they described the clinical, the macroscopic characteristics and histological features of PCOS for the first time[(2)]. TNFα is a dominant pro-inflammatory cytokine vital for immunity to infections and expressed mainly in monocytes, macrophages and adipose tissue. However, its extravagant production is contributory in chronic inflammation and disease pathology [(3).] Studies on reproductive biology have proven that these pro-inflammatory cytokines promote ovarian function and the processes of ovulation, fertilization, and implantation in women with PCOS [(4).] Moreover, TNF-α can also play an important role in the development of cardiovascular disease. A higher levels of TNF-α were reported to be connected with an

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increased risk of future myocardial infarction[5]. IL-18 is a potent pleotropic cytokine, member of the IL-1 family, ambidextrous to induce IFN gamma, GM-CSF, TNF alpha and IL-1 in immunocompetentcells,so as to activate death by lymphocytes, and to up-organize the expressing of chemokine and their receptors [6]. Adiponectin is encoded by the gene ADIPOQ situated in the chromosomal area 3q27. It comprises of three exons and two introns, [7].Human adiponectin is encoded by the 16-kb gene recognized as ACDC (adipocyte C1q and collagen field containing gene). ACDC is situated in a district of chromosome 3 that has been appeared to contain a quantitative trait locus (QTL) connected to phenotypes identified with metabolic disorder [8]. Several single-nucleotide polymorphisms (SNPs) and mutations of the ADIPOQ gene were shown in Japanese and Europe populations to be associated with obesity[9].

Materials and Method

Samples Collection: This case-control study involves of a total (128) samples (50 normal Weight and 78 obese groups). Those samples was collected from the Kamal Al-Samarraie hospital, Ministry-of Health in Baghdad-Iraq from of April 2017- August 2017. Five milliliters of blood was collected from each patient and control then separate 2ml into EDTA tube and 3ml into gel tube after waiting for a minute centrifuged the tube at 3000 rpm for 5 min.

Measurements: Enzyme-linked immunosorbent assay (ELISA) were utilized to estimate the serum level of Human IL-18 ELISA Kit,and Tumor necrosis factor ELISA Kit according to the manufacturer's instructions (bioaimscientific and MabTag) respectively.

PCR Amplification: The DNA was extracted by utilizing (Geneaid DNA Mini Kit) according to manufacturer's instructions, primer used in this study wereADIPOQ gene(rs12495941)sense F: (5′-TAGTGAGCCGAGATTGTGC -3′) and a anti sense primer R:5′-(TCCTTAGGCATGTAGCTTTCC 3′)'obtained from AlphaDNA company (Xian Chang Sun *etal.,* 2017). The PCR amplification is performed in a total volume of 25µl containing 1.5µl DNA, 12.5µl Green Master Mix PCR (Promega, USA), 1µl of each primer 10 pmol then nuclease-free water is added into a tube to a total volume of 25µl. Thermo cycling conditions were as follows: initial denaturationat 4 min at 94°C, followed by 28 cycles of denaturation 94°C for 30 sec, annealing at 62°C for 30 sec, extension at 72°C for 30 sec and a final extension of 72°C for 5min. The PCR products were separated on 1% agarose gel. The gel is left to run for 60min with a 70volt/65 mAmp current. Following electrophoresis, visualization was conducted with a UV trans illuminator after ethidium bromide staining. The sequencing of ADIPOQ gene (rs12495941) gene was performed at Macrogen, utilizing their ABI 3730xl genetic analyzer (Applied Biosystems, US).

Statistical Analysis: The Statistical Analysis System-SAS (2014) program was utilized to impact of various factors in study parameters.. Least noteworthy contrast LSD test (ANOVA) was utilized to analyze between method between various factors in this study.

Result and Discussion

The levels of TNF-alpha, and IL-18 showed significantly change ($p<0.05$) in Obese with PCOS and low weight with PCOS groups when comparing with control group. followed by no-significant change ($p>0.05$)when comparing between Obese without PCOS and low weight with PCOS groups, also shows significant change ($p<0.05$)when comparing between low weight with PCOS and control group. As seen in table (1).

Table (1): Levels of TNF-alpha, IL-18, in PCOS women and healthy controls.

Parameters Groups	TNF-alpha (ng/ml) (mean±SD)	IL-18 (pg/ml) (mean±SD)
Group 1 (Obese with PCOS)	A 1.2040±0.5796	A 26.139±3.660
Group 2 (low weight with PCOS)	B 0.5674±0.0655	B 12.832±0.266
Group 3 (Obese without PCOS)	B 0.6426±0.0517	B 12.391±0.297
Group 4 Healthy control	C 0.3456±0.0852	C 3.040±0.377
LSD	0.209	3.275
P-value	0.0073	0.0069
Significant	Significant	Significant

*different letters mean significant difference

Adipose tissue discharges a cytokine called TNF-a which is a key component in mediating IR[10]. This cytokine not only stimulates IR but also causes HA and is present in follicular development. It therefore plays a part in the pathophysiology of PCOS. Development of IR in humans has been linked to hyperexpression of the TNF-a in muscle and adipose tissues through decreasing

tyrosine kinase activity in the insulin receptors. Our test results corroborated those of [11]. In their experiment they found that there were significant differences between PCOS patients in serum TNF-a and insulin. [12]found that TNF-a levels in PCOS patients were significantly higher than those in controlled studies. When[13,14] carried out tests they found that women with PCOS exhibited higher levels of IL18 than controlled groups. In both the aforementioned studies the level of IL18 correlated to the insulin sensitivity index. More recent tests have shown that there is no difference in IL18 between obese PCOS and the obese control group. This reveals that when obesity is controlled, the PCOS effect disappears completely [15] posits that in the future, studies should classify subjects according to BMI classes so as to better highlight the independent association among IL18 and PCOS[16].

One and a half µl of genomic DNA was used for each PCR reaction. A conventional PCR protocol was utilized to analyze simultaneously the presence of ADIPOQ gene (rs12495941). The presence of the ADIPO gene (rs12495941) was identified by 360bp, as shown in figure (1).

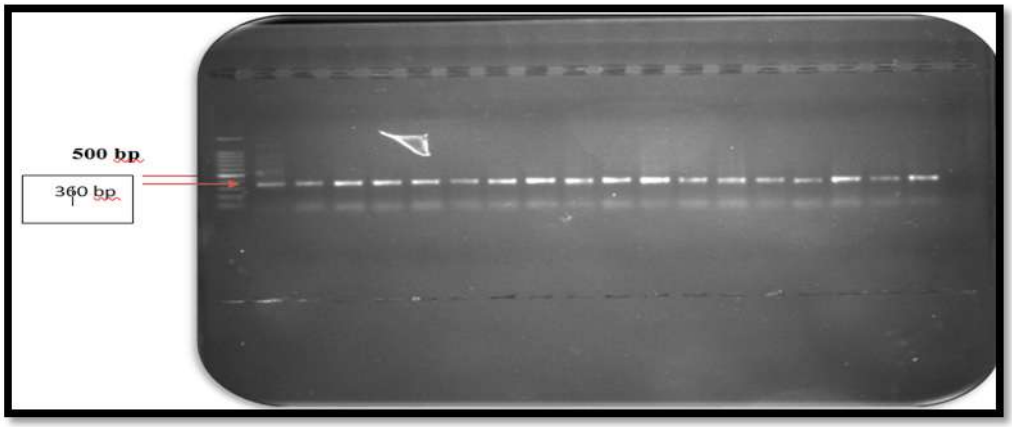

Figure (1): Amplified fragment of Adiponectingene (RS:12495941) after electrophoresis on agarose gel (2%) for 1x TBE buffer for 1:30 hours. M: DNA ladder (100bp).

The repeat of nucleotide the amplified product of ADIPOQ gene (rs12495941) gene by direct sequencing. Our sequences were compared with the reference sequence from in national center biotechnology information(NCBI) Gene Bank.

After alignment of product amplification of ADIPO gene for patients group having three Transition one A>G and two G>A in Locations (15655, 15679 and 15685 nucleotide) respectively, six Transversion T>G, C>A, and four T>A in Locations (15429,15719, 15671, 15713, 15715, 15731 nucleotide) under sequence ID: NG_021140.1, and have number score (685) bits, and expect (0.0). From the Gene Bank, found that part of ADIPOQ gene having 98% compatibility with standard in Gene Bank as shown in Figure (2), and table (2).

Table (2): Represent type of polymorphism of ADIPOQ gene.

Sequence ID	Nucleotide	Location	Type of Substitution
ID: NG_021140.1	T>G	15429	Transvertion
	A>G	15655	Transition
	T>A	15671	Transvertion
	G>A	15679	Transition
	G>A	15685	Transition
	T>A	15713	Transvertion
	T>A	15715	Transvertion
	C>A	15719	Transvertion
	T>A	15731	Transvertion

Homo sapiens adiponectin, C1Q and collagen domain containing (ADIPOQ), RefSeqGene on chromosome 3
Sequence ID: NG_021140.1

Score	Expect	Identities	Gaps	Strand
685 bits(759)	0.0	393/402(98%)	0/402(0%)	Plus/Plus

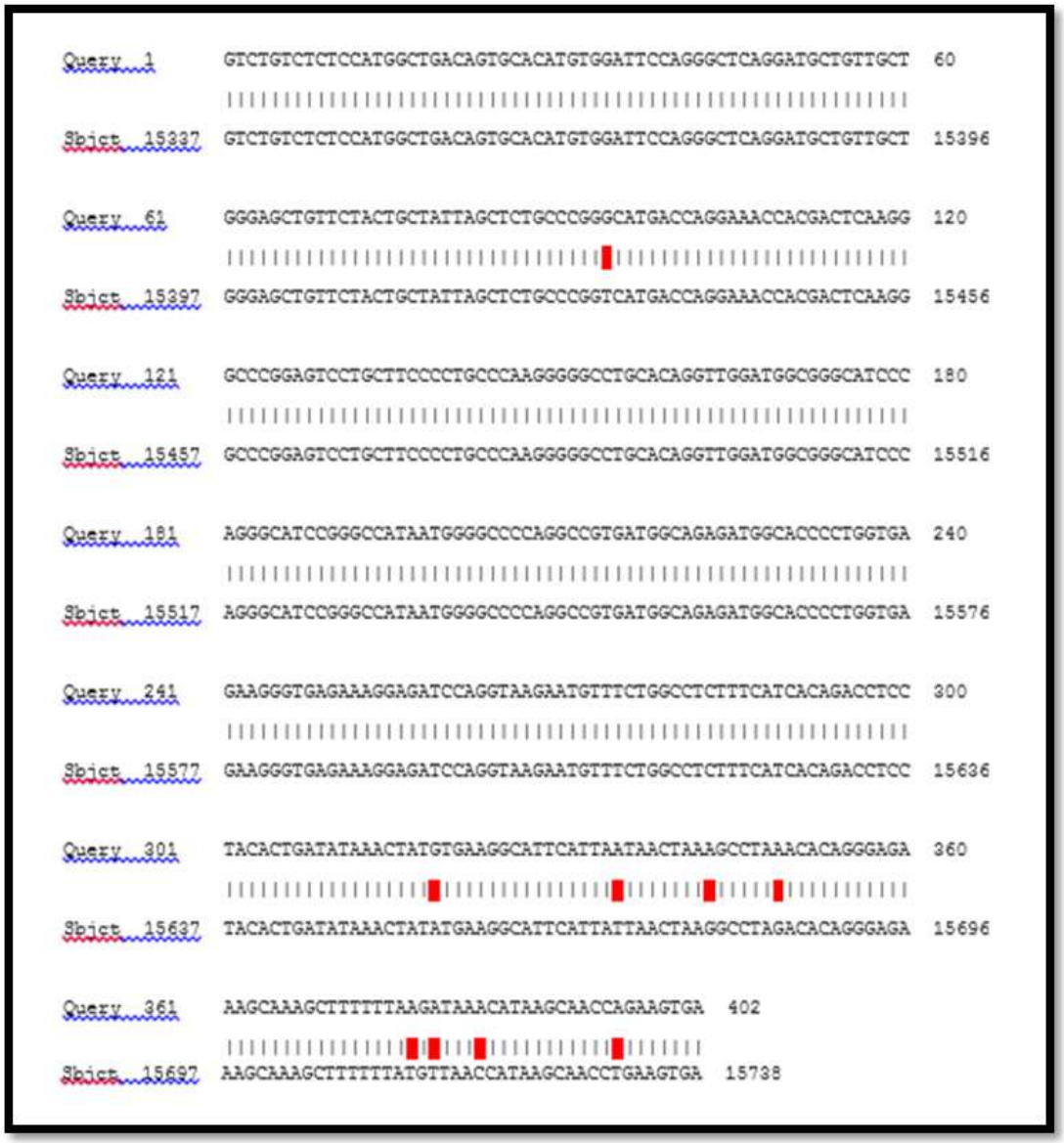

Figure (2): Alignment analysis of ADIPOQ gene of patients group with Gene Bank of NCBI. Query represents from the sample; Subject represents a database of National Center Biotechnology Information (NCBI).

Compatibility of 100% in Gene Bank ADIPOQ gene as shown in figure (3) under sequence ID: NG_021140.1,and have number score (430) bits, so no recorded change noticed from the Gene Bank in ADIPOQ gene for control group.

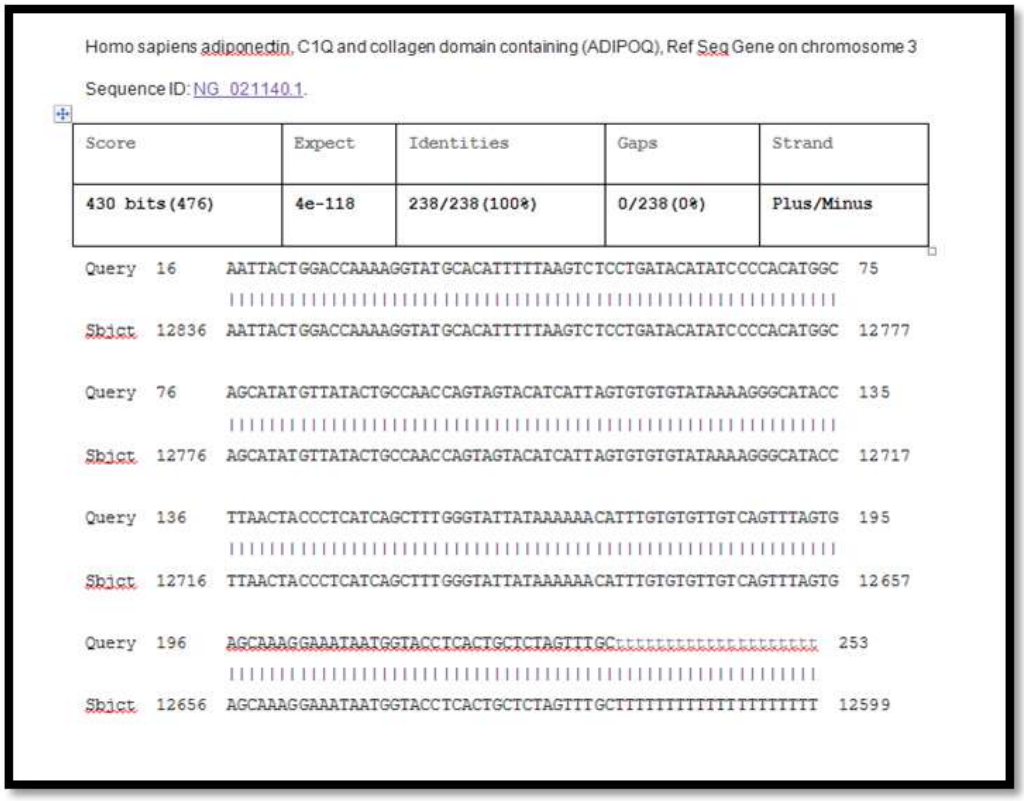

Figure (3): Alignment analysis of ADIPOQ gene of Control group with Gene Bank of NCBI. Query represents from the sample; Subject represents a database of National Center Biotechnology Information (NCBI).

Conclusions

Our study concluded in patients of Polycystic ovary syndrome is increased as compared to healthy controls as evidenced by increased (TNF-α, IL-18) in patients group. ADIPOQ gene having 98% compatibility from patients group while having 100% compatibility of the control group with a standard in Gene Bank

Conflict of Interest: There is no conflict of interest among the authors.

Funding: Self

Ethical Clearance: This study is ethically approved by the Institutional ethical Committee.

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C2 Lateral Mass Vertebrae Anthropometry for Evaluating C2 Straight Lateral Mass Screw Fixation

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Abstract

Background: The cervical vertebra is an important vertebra as there are blood vessels in its surroundings from the brain to the entire vertebrae. Cervical injury has the most fatal consequences when it occurs as high as C1-C2. If instability occurs in the C1-C2 vertebrae and atlantoaxial joints, the procedure of surgical techniques include cervical arthrodesis or spinal fusion. C2 straight lateral mass fixation is one technique that can be used for fixation in patients with spinal cord compression and anomalous vertebral artery by inserting shorter screws in the lateral mass of the C2 vertebrae from the posterior direction. There have been not many references similar to the present study of anatomy to discover the screw characteristics needed in this technique.

Aim: This study aimed to identify the length of the lateral mass in the C2 vertebra for the purposes of the C2 straight lateral mass screw fixation technique.

Method: This research was an observational descriptive study with cross sectional design that observed the results of cervical CT-Scan. Observation was made using the RadiAnt DICOM Viewer application and measurements were based on a sagittal cross section. The length was measured from the posterior parallel to the posterior longitudinal ligament (PLL). The initial mean was measured on the right and left side; afterwards, the final mean is the total mean of both sides.

Result: From 10 samples, there were mean long lateral masses of C2 vertebrae on the right side of 13.511 ± 1.081 millimeters, the left side of 13.444 ± 1.396 millimeters, and the final mean of 13.48 ± 1,216 millimeters. It was rounded to an average of 13.5 ± 1.2 millimeters.

Discussion: The line parallel to the posterior longitudinal ligament (PLL) is more posterior than the line parallel to the foramen transversum wall which causes the measured length to be shorter. This is useful for the C2 straight lateral mass screw technique as it avoids the possibility of lesions in the vertebral artery.

Conclusion: The average lateral mass length in the population of Surabaya is 13.5 ± 1.2 millimeters.

Keywords: *Lateral Mass Vertebrae C2, C2 Straight Lateral Mass Screw Fixation.*

Introduction

The cervical vertebrae consist of 7 bone spaces, namely C1-C7.[1] The cervical vertebra has a transverse foramen in each segment through which the vertebral artery passes.[2] The vertebral artery is tasked with vascularizing the brain; hence, cervical vertebrae injuries and failure to identify can cause serious complications.[3] The most fatal consequences can occur in the upper cervical area, both in the crania cervical junction and

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in the C1-C2 vertebrae.[4] This is because the anatomical structure of the C1 and C2 vertebrae is unique and has a close relationship with the vertebral arteries.[5] Cases of C1-C2 injuries that have dislocations should be surgically removed.[6] The principles of cervical vertebrae surgery are stabilization and prevention of nerve decompression, optimizing the results of actions, and avoiding complications that may occur if non-surgical measures are performed.[7]

Cervical arthrodesis is a surgical treatment that unites one vertebra with another vertebra.[8] This technique can be performed on any cervical vertebra in accordance with the location of the injury. Fusion of vertebrae as high as C1-C2 is used for fusion due to instability in the C1-C2 vertebrae and atlantoaxial joint.[9, 10]

Because of their unique and biomechanical properties, most cervical vertebrae stabilization studies have focused on modification of fixation in C2 vertebrae.[11] Trans-articular fixation resulted in limitations on flexion and extension movements.[12] Meanwhile, the C2 pedicle technique by Harm further reduces the risk of lesions in the vertebral artery compared to the Magerl technique; however, it is still not possible to be used in patients who have anomalies in the vertebral artery.[13] The C2 laminar screw technique is used to avoid lesions in the vertebral artery[14], but this technique is not recommended for patients who require laminectomy to decompress the spinal cord.[15]

To explore the contraindications to the C1-C2 technique, a study in Japan stated that there were 238 (24.4%) cases accompanied by the incidence of compression of the cervical spinal cord[16] and another study asserted that of 200 patients, there were 66 patients with High-Riding Vertebral Artery (HRVA) and 90 patients with narrow pedicles after being detected using thinly-sliced pedicular-oriented CT (TPCT).[17] The high number of these two numbers makes it possible for both conditions to occur in an individual; consequently, other techniques are needed for patients with the mentioned condition.

C2 straight lateral mass fixation is one technique that can be used for fixation in patients with these two conditions. Fixation is performed by inserting shorter sized screws in the lateral mass of the C2 vertebrae from the posterior direction, as is the case in Korea which reduces the risk of bleeding in HRVA patients with C2 fixation by using shorter screws.[18] To date, there are not many references regarding this technique, therefore further studies on the anatomy of the C2 vertebrae are needed to support this fixation technique. Many modifications have been made to avoid complications. This is carried out by changing the entry point of the screw and the direction of screw installation.[19] These modifications can affect the required screw characteristics, such as length and diameter.

Method

This study aimed to measure anthropometric C2 lateral mass vertebrae from the lateral side for the C2 straight lateral mass screw fixation technique in order to determine the appropriate screw requirements and minimize complications that can occur. An observational analytic with cross-sectional approach was used.

Sample: The research samples were the results of the CT scan taken from the Mitra Keluarga Darmo Satelit Hospital, Surabaya in the period of August-November 2017. The sampling technique was conducted by using total sampling with the inclusion criteria of CT scan results as high as vertebrae C1-C7, while the exclusion criteria included CT Scan results with abnormalities of vertebral anatomy as high as C1-C7 and patients who are not domiciled in Surabaya.

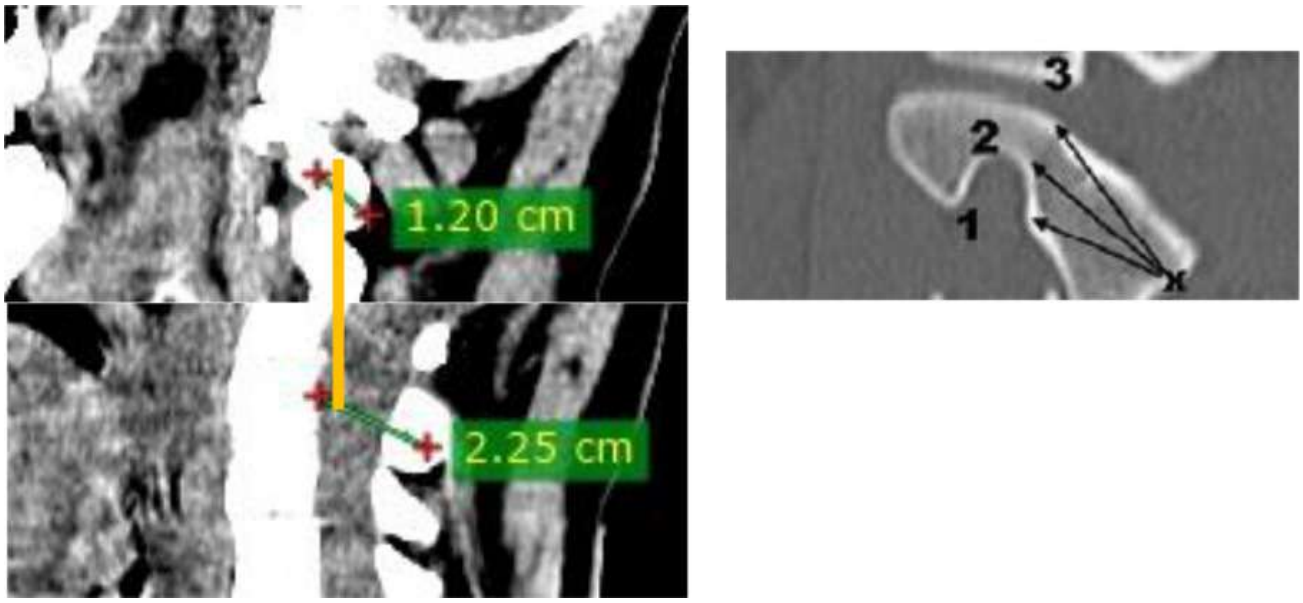
Research Instrument and Data Analysis: The instrument used to measure the CT scan result was RadiAnt DICOM Viewer Application version 4.1.6. The length of the lateral mass of the C2 vertebra was measured at the point of 3 millimeters superior to the facet line, median lateral mass, and anterior-superior direction parallel to the facet until the posterior longitudinal ligament (PLL). The PLL boundary point was initially marked. Afterwards, the length was measured on the slice showing the lateral mass picture from the posterior to the marked point. The initial mean was calculated on the right and left sides; then, the final mean was obtained from both sides. The measurement results were then processed using Microsoft Excel 2016.

Result

The total CT scan results sampled in this study were 10. Observation of radiology results was carried out for 1 week to determine the mean lateral mass in each sample. Lateral mass is the mass located in both right and left lateral of C2 vertebrae. The length of the C2 vertebrae lateral mass was measured from the sagittal cross section at the point of 3 millimeters superior to the facet line,

median lateral mass, anterior-superior direction parallel to the facet to the PLL limit.

Referring to the observation results, it was obtained the mean lateral mass of C2 vertebrae from 10 samples of 13.511 ± 1.081 millimeters with a minimum value of 12.006 millimeters and a maximum value of 15.496 millimeters. Whereas, the mean lateral mass of the C2 vertebrae from 10 samples was 13.466 ± 1.396 millimeters with a minimum value of 11.343 millimeters and a maximum value of 15.630 millimeters (Table 1). The mean left and right lateral mass of the C2 vertebrae obtained a mean total of 13.448 ± 1.216 millimeters with a minimum value of 11.334 millimeters in both sides and a maximum value of 15.630 millimeters in both sides (Table 2).



Picture 1: (a) Measurement of lateral mass from posterior as high as PLL, (b) The marker points parallel to PLL, (c) The measurement limit based on a research in Los Angeles (Hoh, et al., 2010)

Table 1: The Length of C2 Vertebrae Lateral Mass

No	The Length of Right Lateral Mass (mm)	The Length of Left Lateral Mass (mm)
1	12.443	11.343
2	14.618	15.213
3	14.412	13.765
4	12.982	13.863
5	13.601	13.755
6	13.303	14.205
7	12.006	12.005
8	12.631	12.130
9	15.496	15.630
10	13.624	12.754
Mean	13.511	13.466
Min	12.006	11.343
Max	15.496	15.630
SD	1.081	1.396

Table 2 The Mean of C2 Vertebrae Lateral Mass Length

Mean	Length (mm)
Right	13.511
Left	13.466
Total mean	13.488
Min	11.343
Max	15.630
SD	1.216

Discussion

C1-C2 Trans-articular Screw Fixation is the technique that produces the most rigid outcome.[12] The entry point of this technique is at 2-3 millimeters superior-lateral from the facet to the axial isthmus in medial;[12] then, it is forwarded to the C1 lateral mass. C1-C2 joints are very functional in rotational movements

and with a little flexion-extension. Hence, the fixation in this area will cause limitations on flexion-extension movements, lateral swelling, and rotational movements. The screw mounting direction of this technique reduces freedom of movement in all directions so as to achieve a state of high stability. This technique can also prevent slippage between segments.[20] This technique is also an indication for C1-C2 instability due to rheumatoid arthritis, odontoid process fracture, os odontoideum, C1-C2 arthrosis.[12] This technique is contraindicated for the condition of vertebral artery anomalies in segments as high as C1-C2, axial isthmus that is too small, deformities in segments as high as C1-C2, prominent kyphosis in the cervical-thoracic junction, and destruction of the atlas bone lateral mass.

C2 Pedicle Screw Fixation connects the vertebral body with the posterior component of the atlas bone. The screw is mounted obliquely from the pediculus to the vertebral body.[15] The advantage of this technique is that it can protect joints between C1-C2. In addition, it is possible to remove the screw after stability returns to restore movement to C1-C2. Compared with the trans-articular technique, this technique further reduces the risk of injury to the vertebral arteries.[13] The technique is indicated for C1-C2 instability caused by trauma, tumors, and inflammation, for non-fusion odontoid process fractures, unstable Jefferson fractures, and repair in failed odontoid screw fixation.[13] Contraindications are if there are anatomic variations in the vertebral artery.[13]

The entry point of the screw in the C2 Laminar Screw Fixation technique is between the spinous and lamina process, and is directed across the direction of the lamina on the contralateral side.[21] This technique is intended for 20% of patients who have anatomic anomalies that are contraindicated in trans-articular screw or pedicular screw techniques, because there is a risk of vertebral artery injury.[22] If there is a condition that requires decompression of the spinal cord, laminectomy of the axis bone is needed and this technique cannot be performed.[15]

C2 Pars Screw Fixation has the same entry point and direction as the trans-articular technique. The difference with the trans-articular technique is the depth of screw fixation that does not go through the atlas bone.[15]

Based on the results of the study, there have been no similar results from other references to the present study. However, a study with a similar concept was conducted in Los Angeles regarding the lateral mass of the C2 vertebra that used the same entry point and direction as this study and produced an average of 17.0 millimeters on both sides.[23] A case study conducted in Egypt on the evaluation of the efficacy and safety of C2 pars/pedicle screws also has a different number from this study, which used a screw with a size of 16 millimeters for the C2 vertebrae.[24]

The difference in results among studies can be caused by several factors. A factor that may be influential is the anterior border of the measurement. Measurements performed in research in Los Angeles was started from the posterior to the point before the transverse foramen wall,[23] which is different from this study which has a limit to the point parallel to the PLL.

Observation results show that the line parallel to the PLL is more posterior than the line parallel to the transverse foramen wall. This causes the length measured in this study is shorter. This is useful for the C2 straight lateral mass screw technique because it avoids the possibility of lesions in the vertebral artery (Picture 1).

Another factor that might influence differences in results is morphological variation in each different population. A previous study conducted in India has shown that the average antero-posterior length of the right and left C2 vertebrae superior facets were 16.61 ± 1.33 millimeters and 16.70 ± 1.49 millimeters respectively.[5] This result is different from a similar study conducted in Turkey with an average of 17.5 ± 14 on the right side and 17.5 ± 1.5 on the left side.[25] Specific references regarding differences in the lateral mass length of the C2 vertebrae were not found. However, the differences in the results of the two studies above may allow for differences in the lateral mass.

Limitation: There are several limitations in this study. A factor from the author that might be influential is the lack of accuracy in the measurement process. The small number of samples is also a disadvantage in this study. Retrieval of data in only one hospital is presumed to be insufficient to describe the lateral mass length of the entire population in Surabaya.

Conclusion

The mean of C2 vertebrae lateral mass length is 13.5 ± 1.2 millimeters.

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Correlation between Health Locus of Control with Intention to Perform Cataract Surgery in the Area of Public Health Center of Tempurejo Jember

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Abstract

Cataract is a clouding of the lens in the eye that affects vision. Cataract can be healed by surgery. The number of cataract surgery in Indonesia is still low. The small number of cataract surgery in Indonesia happens because they have low health locus of control. Health locus of control (HLC) is an individual's belief that her or his health is dependent upon her or his own behavior until the person has intention in which the time is correct it causes the person take an appropriate action to do something related with the healthy. This study aims to analyze the relations between HLC and intention to perform cataract surgery in the Public Health Centre of Tempurejo, Jember. Independent variable on this study is HLC and the dependent variable is surgery intention on the cataract patients. The research design was analytic observational with a cross-sectional method. Sampling technique in this research it was probability sampling by simple random sampling. The research sample was 84 people using G*Power 3. The result of the statistic test using Spearman rank showed a positive correlation with weak correlation strength between health locus of control with the intention to perform cataract surgery (p-value = 0,001 and r = 0,396). One must have confidence in the source of its health control in order to improve the intention of performing cataract surgery. Health worker role is to increase HLC and intention of cataract patient so that can improve health degrees.

Keywords: *Health locus of control, cataract, intention to perform cataract surgery.*

Introductions

Cataracts are characterized by the lens of the eye that gradually becomes blurred and eventually results in total blindness[1]. Cataracts often occur at the age of 55 years and above sometimes can occur in infants and young children[2]. The problem of cataract patients at Tempurejo Health Center in Jember Regency is that cataract patients are less able to control the disease. For example, such as not conducting an early examination to detect the disease. Cataract sufferers do not have a high willingness to carry out surgery on the disease. Cataract sufferers are less willing to undergo cataract surgery. This is influenced by various factors such as ignorance of patients regarding cataracts. Patients do not know that cataracts can be treated with surgery. Patients do not have fees for surgery and are afraid to undergo surgery.

The incidence of visual impairment in the world is 285 million[3]. The number of cataract sufferers in the world reaches 22 million people and is expected to continue to double by 2020[4]. Of all the causes of 50% blindness caused by cataracts and 90% found in developing countries such as in Indonesia[5]. Cataract prevalence in Indonesia reaches 1.8% of population[3]. The rate of blindness caused by cataracts in Indonesia is the highest in Southeast Asia at 1.5% or 2 million people[6]. In 2013 the prevalence of cataracts in East Java Province was 1.6%[3]. Data in Jember district on the number of cataract patient visits in 2017 was 5000 visits. In Tempurejo Community Health Center the number of visits to the largest cataract patients in Jember district was 181 patients.

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Developed countries have a cataract surgical rate (CSR) rate of 4000-6000 in terms of the number of cataract patients who do not have surgery[7]. If the CSR number is below 500, the country will get red on the WHO blindness map. In 2006 the WHO stated that CSR numbers in Indonesia ranged from 465[8].

Causes of cataracts include congenital abnormalities, aging processes, systemic diseases, trauma, and other eye diseases[9]. The low intention of patients causes the increasing number of cataract patients and the increased number of blindness caused by cataracts. The low intention of cataract patients can be caused by various factors namely low economy, lack of information and knowledge, and the attitude of patients to cataracts[10]. Cataracts can cause interference with blindness. This has become a global health problem that can reduce the productivity and quality of human resources[11].

One of the most effective ways to treat cataracts is cataract surgery[12]. Cataract surgery is a surgical treatment [1]. Cataract surgery in Indonesia can be carried out at a cost that is not too expensive and guaranteed by the Social Security Organizing Agency. In Indonesia the number of cataract patients is still high, this is not balanced with the number of cataract sufferers who have performed surgery[3]. The willingness of patients to undergo surgery must have intention first[13]. Besides that, health locus of control is a belief about health-related events[14].

Materials and Method

Purpose of this study was to analyze the relationship of HLC with the intention of carrying out cataract surgery. The study design used observational analytic research with cross-sectional approach.

The sample of this study were cataract patients in Tempurejo Public Health Center, amounting to 84 respondents. Research from October 2017 to March 2018. The sampling technique uses simple random sampling. Determination of sample size using the application G * Power 3.

The instrument of this study used a multidimensional HLC scale questionnaire and the intention questionnaire underwent a valid and reliable operation[15].

The results of the research data are abnormally distributed so that using the Spearman rank test.

Results

Characteristics of Respondents:

Table 1. Distribution of characteristics of respondents based on age

Variable	Mean	Median	Min-Max
Age (Years)	58.86	60.00	49-68

Table 1 shows that the mean age of respondents is 58.86 years.

Table 2. Distribution of respondents by sex, education level, and the type of work

Variable	f	%
Gender:		
a. Male	27	32.1
b. Female	57	67.9
Level of education:		
a. not school	54	64.2
b. elementary	25	29.8
c. junior	4	4.8
d. high school	0	0
e. college	1	1.2
Type occupation:		
a. Not working	28	33.3
b. Government employees	1	1.2
c. Farmers	35	41.7
d. Entrepreneur	2	2.4
e. Housewives	18	21.4

Table 2 shows that most female sexes were 57 respondents (67.9%). The majority of respondents were not in school (54.2%). Most types of work of respondents are farmers as many as 35 (41.7%).

Health locus of control (HLC):

Table 3. Distribution of respondents based on the HLC category

Variable	Jumlah	%
HLC:		
a. High	0	0
b. Medium	1	1.2
c. Low	83	98.8

Table 3 shows that the majority of respondents' HLC is categorized as low as 83 (98.8%).

Table 4. Distribution of respondents based on the HLC category

Indicator	Mean	Median	Min-Max	Achievement (%)
Internal HLC	14.01	11.00	6-33	38.91
Chance HLC	7.75	6.00	6-32	21.52
Powerful HLC	8.42	6.00	6-22	23.38

Table 4 shows the highest average value of the HLC indicator on the internal HLC indicator, which is 14.01.

Intention to do cataract surgery:

Table 5 Distribution of respondents based on intention category to do cataract surgery

Variable	Jumlah	%
Intention to do cataract surgery:		
a. Height	0	0
b. Moderate	7	8.3
c. Low	77	91.7

Table 5 shows that most of the intention to do cataract surgery in the low category was 77 (91.7%).

Relationship HLC with the Intention to Perform Cataract Surgery:

Table 6. Results of Spearman-rank correlation test of HLC with the intention of doing cataract surgery

Variable	p-value	r
HLC Intention to perform cataract operations	0.001	0.396

Table 6 shows the p-value = 0.001 means that there is a relationship that means HLC with the intention to do cataract surgery. The correlation coefficient of 0.396 means the direction of a positive correlation with weak strength.

Discussion

The Characteristics of Age: That the age range of respondents ranged from 50 to 72 years with an average age of 60.6 years[16]. Senile cataracts occur due to degeneration or deterioration in the quality of lens fibers due to the aging process. This is experienced by elderly patients aged 40 years and over[17].

The Characteristics of Gender: Another study stated that female respondents were 25 people (62.5%)[18]. In developing countries, the number of female cataract patients is greater than that of men[19]. Hormonal problems in menopausal women cause damage to several organs including the eyepiece. This resulted in women being more prone to cataracts than men[17].

The Characteristics of Education Level: Other research shows that the education level of the respondents is mostly not in school or does not complete school by 42 people (63.6%)[20]. Low educational factors have an impact on the knowledge and understanding of cataract patients about the treatment of their diseases[21]. The level of education affects a person's knowledge and understanding to access health services[22].

Health Locus of Control: A person with an internal locus of control will increase with age[23]. This is related to the level of maturity of thinking and the ability to make decisions[24].

Gender influences HLC stating that female diabetics show higher values in all parameters than men[25]. This is because men and women respond differently to certain test items[23]. Culture is one of the factors that influence locus of control such as western and eastern cultures[26]. American culture more towards self-reliance and individualism whereas Asian cultures emphasize the dependence of society and interdependence[23].

HLC is the degree of one's belief whether their health is controlled by internal or external factors[27]. Social learning theory provides an influence on health through the learning process, each individual develops the belief that the results obtained are actions of himself or from outside himself[23]. After someone has a locus of control and has hope that will result in strengthening and knowing the source of reinforcement from internal and external will be motivated to behave as predicted in certain situations[28,27,29,30].

Research on chronic disease patients in Shiraz, Iran showed that the highest scores were at IHLC (M = 23.15), PHLC (M = 17.62) and CHLC (M = 15.25)[31]. Research in type 2 patients in Iran had the highest scores on 26.6 IHLC, 23.2 PHLC, and 9 9 CHLC[32]. Research in DM patients in Croatia shows that most patients have high IHLC[33]. The three studies in Asia showed the highest average scores on the IHLC[31,32]. Research in Europe has the highest average score on the IHLC[13]. This proves that culture can affect HLC. But that does not mean that one's culture always determines the type of HLC[34].

The older the age, the locus of control develops towards the internal and stable in middle age[35]. This

shows an IHLC score higher than the CHLC and PHLC scores because the number of male respondents is less than women[32].

Intention to Perform Cataract Surgery: Other research shows that the majority of respondents have not optimal intention values[16]. A low value of intention means that someone does not have optimal intentions[36].

The intention is a person's tendency to carry out certain behaviors[37]. The intention has a strong relationship with behavior, so intention can be used to predict behavior[13]. Attitude toward the behavior is a person's attitude or evaluation positively or negatively towards certain events or behaviors[13].

Attitude toward the behavior that someone will do behavior based on belief in the behavior. Mismatch of skills, abilities, and information produces problems for behavioral control and means that this problem can be overcome as in compulsive behavior[13].

The Relationship Betwen HLC and The Intention to Carry Out Cataract Surgery: Research shows that HLC affects the self-care behavior of type 2 DM patients and is found to be a positive direction[38]. Locus of control describes a person's view of responsibility for events in his life[39]. When someone considers the locus of control to be in him, it will achieve greater achievement in his life because that potential can be utilized to be more creative and productive[40].

The results of other studies that HLC affects the self-care behavior of type 2 DM patients, the higher the value of HLC, the higher the value of self-care type 2 DM patients[38].

HLC is influenced by the level of education. Internal HLC increases when education levels increase, while chance locus of control decreases with increasing levels of education[32].

Conclusions

The value of HLC in cataract patients is mostly low. The value of intention to do cataract surgery is mostly low. Positive direction shows that the higher the HLC, the higher the intention to do cataract surgery.

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Implementation of Tender Loving Care-Based Growth and Development Monitoring by Health Cadres

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Abstract

Tender Loving Care (TLC), in providing professional care, is seen as the greatest virtue dedicated to care. It is used to describe how love is shaped and refined to meet the requirements of practice. These are the values of TLC-based care, particularly in growth and development services performed by the cadres in *Taman Posyandu*. This research aims to describe the efforts of TLC-based early childhood growth monitoringin *Taman Posyandu*. It is a kind of quantitative study with a cross-sectional approach. This research was carried out in four districts (cities) in East Java with the great sample of 320 *Taman Posyandu*. The results revealed that most cadres were more optimal in monitoring growth activities while lacking in the ability of TLC-based early childhood development monitoring. Therefore, more effort is needed in approaching and training deeply to provide the knowledge to the cadres about the importance of serving with heart, as an effort to monitor TLC-based child development.

Keywords: *Health cadres, growth and development monitoring, Tender Loving Care (TLC).*

Background

The term Tender Loving Care (TLC) plays an important role for nursing practitioners since it reflects the core goals and essence of care for patients. The feelings are the element of motivation that drives the nurses. The feelings of compassion for others, followed by an empathetic approach, are a requirement of caring about others. What stands out in TLC is the relationship between care and love[(2)].TLC, in providing professional care, is seen as the greatest virtue dedicated to care. It is used to describe how love is shaped and refined to meet the requirements of practice[(3)]. This consideration is the main focus given to everyone as a worthy individual.

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Care is a softer expression than loving. TLC is a routine or habit related to caring, maintaining cleanliness, feeding, and giving attention and affection to children. It plays an important role in the survival, growth and development of children[(4)]. Child growth and development services in Indonesia are implemented in Community-sourced Health Efforts or *Upaya Kesehatan Bersumber Masyarakat* (UKBM) in the form of *Taman Posyandu* (Tapos). Cadres are one of the drivers of the success of health programmes, especially community-based health programme. Cadres who have good competence will be able to better provide good information and deliver knowledge to mothers.

There is a strong evidence showing that cadres can provide better health outcomes, especially in the field of child health[(5)]. They play an important role in determining the success of children's growth and development as well as maternal health, because the mothers get health information first through the cadres[(6)], including the information about care and fulfillment of the needs for children.

Based on the data from East Java Provincial Health Office in 2013, the coverage of detection of child growth in East Java was still 70.34%. In addition, growth and development monitoring carried out at *Posyandu* had also not been encouraging. Only 49.4% of the toddlers who got the growth monitoring in 4 times or more within 6 months, 23.8% of children under five were not weighed, only 30.5% of children under five had Health Services Card or *Kartu Menuju Sehat* (KMS) and only 25.5% of children under five had Maternal and Child Health or *Kesehatan Ibudan Anak* (KIA) book [7].

TLC, in providing professional care, is seen as the greatest virtue dedicated to care. It is used to describe how love is shaped and refined to meet the requirements of practice (3). Feelings of compassion for others, followed by an empathetic approach, are the requirements for caring about others. What stands out in TLC is the relationship between care and love [2].This research aims to describe the efforts of TLC-based early childhood growth monitoring in *Taman Posyandu*

Material and Method

This research is a kind of quantitative study with cross-sectional approach. It was carried out in four districts (cities) in East Java; Blitar, Ponorogo, Surabaya and Jember. The sample was 320 *Taman Posyandu* spread in the four districts or cities. Inferential analysis to obtain the measurement model used a Confirmatory Factor Analysis (CFA).

Findings:

Characteristics of Respondents: The most of *Taman Posyandu* chosen as the research sample was in the optimal category (64.06%). Based on the age of health cadres in 320 *Taman Posyandu*, the majority was ≥ 45 years old, while the least was 30-34 year olds. The age group ≥ 45 years old dominated in each city of the research area. All cadres who became respondents in 320 *Taman Posyandu* were women. There were no male cadres, even though there was no prohibition for a man to become a cadre. The largest ethnic group of *Taman Posyandu* cadres was Javanese (89.06%), while the remaining 10.94% was Madurese. The latter was found in Jember (Pandalungan) and Surabaya. Based on their education, most of the cadres of *Taman Posyandu* was high school graduates. Education with the least percentage was elementary and Diploma or Undergraduate Degree. The majority of cadres in East Java had become the cadres for *Taman Posyandu*for more than five years (63.44%), except in Blitar with the highest percentage of cadre work period 3-4 years.

The special characteristics needed to deeply find out about the cadres of *Taman Posyandu* are the marital status, number of children and length of being the cadres. This is important to analyze in terms of the application of the principles in TLC services of growth and development in *Taman Posyandu*. Most of the cadres of *Taman Posyandu* had marital status (96.3%) and raised the children of 1-2 people (72.5%). Most of them had served as cadres for more than 5 years (63.44%), meaning that they were no longer newly trained cadres yet cadres who had considerable experiences. This was indicated by data implying that most cadres had been training as the cadres of *Taman Posyandu* (82.5%).

Cadres' Ability in TLC-based Growth and Development Monitoring:

Table 1. Ability in Communication and Indicator Validity

Indicator	Median	IQR	Minimum	Maximum
TLC-based communication ability				
1. Knowledge in growth monitoring	4	2	2	4
2. Knowledge in development monitoring	4	2	2	4
3. Ability in growth monitoring	4	2	2	4
4. Ability in development monitoring	3	1.73	2	4
Factor of loading (λ)	**1**			
t-value (tλ)	**11.99**			

Based on Output Lisrel as shown in table 1, it can be concluded that the index composing the competence of the cadres of TLC-based *Taman Posyandu*is a valid index since the value of the factor of loading is ≥ 0.5 and significant since the t-value is ≥ 1.96.

The ability to carry out the TLC-based growth and development monitoring contributed 1 in compiling the competence of the cadres of *Taman Posyandu*. The indicators that make up the ability in growth and development monitoring were arranged from the biggest to the smallest influences such as knowledge in growth monitoring of 0.65, ability in growth monitoring of 0.54, knowledge in development monitoring of 0.53, and ability in development monitoring of 0.48. The overall indicators made a positive contribution.

Table 2. Factor of Loading in Indicator of Communication Ability

Index of Competency	Indicator	Factor of Loading (λ)
TLC-based ability in growth and development monitoring	1. Knowledge in growth monitoring	0.65
	2. Knowledge in development monitoring	0.53
	3. Ability in growth monitoring	0.54
	4. Ability in development monitoring	0.48

The table informs that the implementation of the cadres of TLC-based *Taman Posyandu* monitoring is all valid indicators since it has a value in loading≥ 0.3. Based on the factor of loading value, it can be concluded that the dominant indicator in growth and development monitoring is indicator of knowledge in growth monitoring (0.65). Meanwhile, the lowest ability is the ability to monitor the progress contributing for 0.48 with the overall positive effects.

Discussion

Cadres are part of the children's environment that contributes to give a support to children by playing an important role in providing an appropriate environment, fulfilling children's basic needs, security and helping children prepare for their future, thus it is important for the cadres to have good competence. TLC-based cadre competencies can be improved through care, responsibility, appreciation, and knowledge in conducting guidance and supervision for child development.

1. **TLC in Growth Monitoring:** Growth is an easy-observed condition and can be measured using a measuring instrument. However, in its implementation, a cadre must have knowledge or competencies so that the results of monitoring are more accurate [8]. There are 4 important aspects in implementing TLC in growth monitoring; knowledge, care, respect & responsibility.

   a. **Knowledge,** in growth monitoring activities, can be applied in the form of understanding to monitor the growth of children in *Taman Posyandu.* It is necessary to weigh the weight, measure the body length and head circumference. This means that before weighing the position of the balance must be correct in 0 (zero) position and the cadres have to ask the parents why the children do not gain weight, if they find such a case.

   b. **Care,** in growth monitoring,can be realized in the form of weighing or measuring body height or head circumference gently, seeing the results of measurements carefully, eager to monitor the growth, involving the mother in measurement, taking measurements to completion, and using adequate equipment

   c. **Respect,** in growth monitoring,can be applied to dearly calling children activities when weighing, not comparing growth in each child, not reprimanding publicly about the results of monitoring, but paying attention to complaints from parents

   d. **Responsibility** can be applied in the form of weighing the body weight, or measuring the body height and head circumference carried out in the right way, repeating measurements if there are doubts, reporting the results of measurement to the responsible person, immediately carrying out the data collection for children who do not come in the measurements.

2. **TLC in Development Monitoring:** In line with the growth, children's development can be measured if the cadre has a good knowledge in early detection of child development. The cadres of *Taman Posyandu* can show the form of TLC to children if they have a clear understanding on how to do early detection or monitoring. There are four important aspects in implementing TLC for development monitoring, namely knowledge, care, respect & responsibility.

    a. **Knowledge,** in the duties of the cadres for growth monitoring activities, can be performed by taking SDIDTK training, routinely monitoring the development of children who come in *Taman Posyandu*, understanding how to use a child development card or KPSP

    b. **Care,** in monitoring the progress, can be implemented in a skillful manner to carry out the development monitoring by using KPSP, KKA, TDD, TDL, CHAT, GPPH, right in concluding the monitoring and the results of progress monitoring must be delivered to the parents privately, not by frightening the parents about the results of monitoring, but giving an understanding on how to monitor the progress.

    c. **Respect** can be applied by doing harmless actions, interacting well with parents or children during the development monitoring by using KPSP, KKA, TDD, TDL, CHAT, GPPH, praising the efforts made by the mother, and explaining the problem of child growth secret.

    d. **Responsibility** can be manifested in the form of careful development monitoring, asking other cadres to repeat monitoring if there are suspicious results, monitoring developments, and showing their seriousness to help while monitoring the progress.

The results of the competency of monitoring revealed that all cadres had the lack of ability in TLC-based growth monitoring. Monitoring children's growth and development is not easy to do since it requires good knowledge and abilities in making precise measurements, neat recording, and conducting appropriate follow-up. The cadres of *Taman Posyandu* in the research area were mostly high school graduate and lacking in obtaining SDIDTK training. Both of these factors and their relation to cadre abilities and skills happened due to the lack knowledge which leaded to thelackof monitoring.

The ability in monitoring of TLC-based children's growth and development consists of the elements of care, responsibility, and respect. The form of care is to make gentle measurements and involve the mother. Respect is the act to accept the differences in measurement results and does not label the children. The form of responsibility is to make appropriate measurements and demonstrate commitment in monitoring. Children's growth and development monitoring can be called early detection so that if there are irregularities, it can be immediately addressed. This success must be supported by the active participation of the parents by referring their children to *Taman Posyandu*. Therefore the programme requires an optimal support from the government, community, community leaders and health officers.

Conclusion

The efforts to monitor the growth and development on early childhood are intact unity competencies that must be possessed by health cadres in carrying out their duties in *Taman Posyandu*. TLC-based growth monitoring will improve the quality of services in *Taman Posyandu*, because it prioritizes the aspects of care, responsibility and respect in providing services to children. Unfortunately, the limited levels of education and ability make TLC-based growth and development efforts by cadres in *Taman Posyandu* not optimal. Therefore, it needs further efforts to improve the quality of its services.

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Regional Health Care: Does Give Benefits for Poor Communities?

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Abstract

This research to observe implementation of the regional health care program of Banyuwangi Regency, especially in the implementation of pro poor budgeting in poverty alleviation and the benefits received by the poor. The method used in this research is descriptive qualitative with respondents and the informants are beneficiaries of regional health care, health offices and technical support officers at the village/urban village office. The results of this study indicate that the implementation of public health care in Banyuwangi has been going well. The poor health care program in Banyuwangi is more commonly called the Declaration of Poor Letter (SPM). Problems rise from the implementation of the SPM are convenience for some people who have access to village officials, so that they can have SPM. In addition to the single parent, the difficult rule which states that only family members in a Family Card that can take care of SPM. We suggest for regional goverments to increase human resources at the village level in SPM services. Most of the respondents, 95 percent stated that the regional health care program provides considerable benefits for the community, especially the poor.

Keywords: *Regional health care, Declaration of Poor Letter (SPM), poor community.*

Introduction

Regional autonomy system expects full participation of the community and regional government to be able to realize regional welfare and independence in development. The main problem of development is that poverty and the main goal of the central government and regional governments to reduce it. Poverty is an integrated problem with various other sectors such as health, education, infrastructure and community income. Decresing poverty is expected to improve the quality of development, therefore regional government look for the potential regional to reduce poverty and improve the quality of human development.

Poverty are factor of lack of capital, productivity in poor households so that they reduce spending in the education and health. Low-income people have relatively low spending in the health sector, adequate access to education that informs about health, nutrition and disease prevention.[1,2] Some research states that the health sector has an impact on human resources that has an effect on economic growth and has a positive impact in developed countries. This shows that the role of government in developed countries is greater in the health sector than in developing countries [3–5].

Public expenditure is intended for management to public needs creating public welfare. Welfare is determined by the source of income or adequate income by having jobs according to ability and talent. Besides that, the services needed by the people of his country not only the availability of public needs (water, electricity, health, education, security) but also other public rights to be eligible for life [6].

Pro poor budgeting are (1) a budget that directs the importance of development policies of the poor, (2) the practice budgeting policies that are design aimed at making policies, programs and projects that are pro-

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poor community, (3) budget policies whose impact can improve welfare and basic needs of the poor people. Pro-poor budget requires support through pro-poor policies which commitment from the government to prioritize poverty alleviation. In general, pro poor policy is a political action carried out with the aim of providing the allocation of rights and resources to individuals, organizations and territories that are marginalized by the market and the state. This can be interpreted that the policies taken by the government must emphasize the improvement that affect the problem of poverty. The realization of the allocation and distribution is to provide basic services in the form of education, health, housing and others[7,8]. Health capital can increase the return on investment devoted to education, because health is an important factor so that someone can attend school for learning. Longer life expectancy can increase returns on investment in education, while better health will lead to lower levels of education depreciation [9].

The human development index in Indonesia is quite low. One of the provinces with low human development index is East Java. East Java from 2010 to 2015 experienced an increase in the human development index even though it only ranged from 0.5 to 0.8. This shows that the efforts of each city/regency are very strong to realize a better community life. As one of the regencys in East Java, Banyuwangi Regency is one thatcommitted to reducing poverty by improving the quality of human development. The commitment of the government can improve the quality of public health, especially the poor. Although indirectly the population's health will improve quickly but government intervention in providing health services or health subsidies will have a good impact both the access of the poor to health services [3,10–12].

Increasing human development index of Banyuwangi Regency shows the commitment of the local government to improve the quality of education, health and community income as three factors making up the human development index. One form of this commitment is an increase in local government expenditure in the education and health sector. One of the policies set out in Banyuwangi Regent Regulation No. 28 of 2016 concerning Guidelines for the Implementation of the Regional Health Care program and Health Services through a Poor Declaration Letter. The regulation stated that the Banyuwangi Regency Government provided the Regional Health Care program (Jamkesda) for participants who were not included as Contribution Beneficiaries (PBI) participants and the National Health Care Program (JKN). With the support of local government programs, it is expected that access to health for the community, especially the poor, will be easy, because the facilities provided are not only for outpatient but also inpatient facilities. It is hoped that the community, especially the poor who need it, will be able to receive benefits from this local government program. For this reason, this study will examine the benefits received by the community, especially people with incomes below the average decent income in utilizing the Regional Community Health Care program, especially in Banyuwangi Regency.

Based on the situation analysis presented, this study looks for the implementation of the BanyuwangiRegency Health Care and its impact on the poor. Several studies on health programs from the government have been carried out such as the results of Wagstaff's (2011) research using the Benefit Incidence Analysis (BIA) in Vietnamese society found that health social care in Vietnam is more enjoyed by the rich than the program's goal to reduce poverty. While the Afghanistan Ministry of Health's research (2013) shows that public spending on health is still concentrated in Afghanistan Central Hospital, so there is still a need for grouping for government programs related to health. In China, Zhao (2019) found that since the adoption of NCMS the rural poor did not delay treatment to the hospital, so that they could receive treatment in a timely manner [10,13,14].

Material and Method

This type of research used in this research is descriptive qualitative research, which is research that emphasizes the quality of the process rather than just the final result. The approach used in this research is a descriptive approach that emphasizes the individual in understanding and creating his daily life. A descriptive qualitative research approach is more likely to explore information from sources and respondents directly and written narrative so that it is easily understood by other communities. The focus of research in qualitative research is useful in providing direction during the research process, especially at the time of data collection, namely to distinguish data relevant to our research goals. The focus of this research is the community receiving health care for the poor in Banyuwangi Regency in 2016. The limitations of the study year are due to the existence of a data system in the BanyuwangiRegency Health Office.

This research was carried out in Banyuwangi Regency within a period of one year with a sample selection in the form of Regencys resulting from random purposive sampling based on Regencys with the largest recipients of health care for the poor. Subjects and sources of information in this study are the Banyuwangi Regency Health Office, Sub-District Officers and Village Heads, Officers at the village/urban level who are in charge of taking care of the Poor Statement and Recipients of Regional Health Care using the method of observation (observation) and in-depth interviews. In 2016 Jamkesmin recipients in Banyuwangi were 506 people, so researchers took samples to conduct in-depth interviews as 84 beneficiary program.

Findings: The health care program for the poor is a national program that is integrated with the regions. There are three criteria for the Jamkesmin program in Banyuwangi Regency, namely financing from the Central Goverment, funding from the East Java Provincial Government and from the Banyuwangi Regional Government. The Health Care Program for the Poor has been legally through Banyuwangi Regent Regulation No. 8 of 2017 concerning Guidelines for Implementing Health Services for the Poor in Banyuwangi Regency. This regent's regulation states that the health of the poor who are not included in the Contribution Beneficiary Participants (PBI) of the National Health Care Program (JKN) will be provided by the Banyuwangi Regency Government. The *Jamkesmin* Program in Banyuwangi is also called the SPM Program. The SPM program (Declaration of Poor Letter) is a letter or identity given to the community outside JKN membership that meets the criteria of being poor. The first process of issuing this letter was a recommendation from a local Household Head (RT/RW) which was strengthened at the Village/ Urban Head and known to the Sub-district Head. The second process is the issuance of SPM by authorized officials in this case the Social Office which has been legalized by the Health Office.

The financing of this health program includes funding for outpatient and inpatient care at health service centers and hospitals in collaboration with the Banyuwangi Regency Government, including Health Center, Blambangan Regional Hospital, Genteng Regional Hospital and East Java Provincial Hospital. Financing of this SPM program is fully charged to the Regional Development Budget of Banyuwangi Regency on condition that there is no duplication from other sources. For people who get a Declaration of Poor Letter (SPM) can receive services free of charge valid for three months and when they have expired can be extended.

The SPM can be issued manually or electronically. SPM issuance is manually issued if the electronic publishing process cannot be carried out. The status of patient participation must be ensured from the beginning of entry to the Advanced Referral Health Facility (FKRTL) and given the opportunity to administer the SPM no later than 3 (three) working days after the patient is admitted to the hospital, if until the specified time the patient cannot show the SPM, the financing is stated as general patient. If the patient is in an emergency condition and has been hospitalized, the Health Center will issue a referral based on the Certificate of Hospitalization from the Hospital. This SPM is only valid for 3 (three) months from the date set. If the SPM is used when it expires, an extension must be made by carrying out all procedures from the beginning.The average time needed for the issuance of the SPM is around 1-2 days. This is in accordance with existing regulations that the opportunity to take care of SPM no later than 3(three) working days after the patient is hospitalized. However, based on the results of interviews with SPM user respondents, the SPM issuance process before 2017 is still done manually.

In accordance with the results of interviews with village officials, that the SPM submission by the applicant is required to bring a referral letter from the Health Center/Hospital after which the applicant completes administration and submits SPM requests to service officers at the village/urbanoffice. The village/ urban official will input data on the online SPM system so that the SPM can be issued.

Discussion

The problem that occurs when interviewing beneficiaries and health providers is that some people who submitted SPM have been treated at the regional hospital so that the village/urban is late in issuing SPM so that patients are not accommodated for financing health services. To anticipate this, some respondents stated that they made SPM without any health problems just in case. Another problem is the incomplete requirements submitted by the SPM applicant. The SPM can be issued even in the absence of a referral letter from the Health Center or Hospital due to the close relationship factor between the applicant and village officials. One of the reasons respondents use SPM as a precaution is because the person who can apply for SPM is the person

concerned or family on a family card, it is quite difficult for respondents, especially single female parents and have children who are still not old enough. Although according to the Health Department this method can reduce brokering practices but for single parents especially women it is quite difficult because besides they have to take care of sick family members, they also have to take care of SPM.

In addition, some respondents felt that not all SPM recipients were poor people. Some beneficiaries are believed to be capable communities, only because of the proximity to village officials, they have easy access to SPM. The lack of socialization in the community about the criteria of the poor and the criteria of SPM recipients also makes the community not fully understand the categories of the poor. On the other hand, the regional government through the Health Service seeks to provide health services to the poor evenly and on target, not to cause double funding in the community. In addition to the SPM beneficiary criteria that have not yet been socialized, one of the obstacles is the area of Banyuwangi Regency. From the 2016 SPM beneficiary data of 506 beneficiaries, 60 percent of beneficiaries are located in areas close to the city, with a radius between 30-40 km. this reinforces the statement from the public that there is a lack of socialization about SPM.

From the positive side of SPM, the implementation of comparisons between the handling of SPM manually and online is very different. Managing SPM online in accordance with the statement of the village head and the health office only requires a maximum of one day. Meanwhile, according to the results of interviews with respondents, online SPM maintenance can take up to three working days, faster than the time needed for manual handling because it takes approximately one week. The differences in SPM maintenance need to be minimized so that all people are able to reach them. Besides SPM service officers at the village level also need to be added so that the task runs optimally. Most of the respondents, 95 percent stated that the regional health care program provides considerable benefits for the community, especially the poor.

Conclusion

From the results of this research it can be concluded that the Poor Public Health Care Program in Banyuwangi Regency from the Local Government Budget is called the Declaration of Poor Letter (SPM). Namely the health care program for the poor with beneficiaries who do not receive health care from the central government and others source. The implementation of the SPM program in Banyuwangi has several constraints, namely the SPM recipients who are not on target because of the tendency of alignments of village/urban officials, lack of human resources in carrying out online issuance of SPM and targets who are able families.

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Measures of Modern Society to Limit the Prevalence of Sexually Transmitted Infections

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Abstract

Sexually transmitted infections are a group of diseases that include syphilis, gonorrhea, chlamydial and mycoplasma infections, trichomoniasis, herpes and HPV infections of the genital organs. In addition, sexually transmitted human immunodeficiency virus, causing a disease called acquired immune deficiency syndrome. According to the World Health Organization, every year more than 340 million people aged 15-49 suffer from sexually transmitted infections worldwide. The basis for the prevention of the spread of sexually transmitted infections and infection with the human immunodeficiency virus should be considered the presence of internal moral attitudes. The motive for the start of sexual life should be your own conscious decision, and not pressure from a partner, fear of losing him, desire to please him and preserve the relationship. Despite the rather wide spread of sexually transmitted infections and the occurrence of infection with human immunodeficiency virus, the implementation of the simplest recommendations guarantees the safety of intimate life and preservation of health. A clear legal regulation of actions of a sexual nature, associated with the risk of infection or entailing infection with sexually transmitted infections, helps to curb their distribution. It is essential for maintaining the sexual health of people of young and mature age, which is an important resource of any country.

Keywords: *Infections, sexual transmission, inhibition of dissemination, legal basis, sexually transmitted diseases.*

Introduction

The development of medicine, going forward, has provided great progress in understanding the spread, development, course of various diseases[1,2]. Serious long-term studies have allowed to shed light on the features of infectious and non-infectious diseases[3,4]. A great step in medicine was the invention of antibiotics, which put the infectious diseases under serious control[5], including sexually transmitted infections (STIs). However, to completely solve the problems of this group of diseases, which are transmitted mainly through sexual contact from a sick person to a healthy person, has not yet been resolved. STIs include syphilis, gonorrhea, chlamydia and mycoplasma infections, trichomoniasis, genital herpes and papillomavirus infections. In addition, sexually transmitted human immunodeficiency virus, causing a disease called acquired immune deficiency syndrome. In addition, during sexual contact, in addition to STIs and the human immunodeficiency virus, viral hepatitis B and C are transmitted, as well as some other diseases (scabies, pubic lice, molluscumcontagiosum)[6].

According to the World Health Organization, every year more than 340 million people aged 15–49 get STIs worldwide. At the same time on the earth every sixth inhabitant has a sexually transmitted disease. In recent years, the countries of the Union of Independent States have tended to decrease the rates of growth in the incidence of STIs, which is associated with significant health care efforts and the improvement of society as a whole. In the Russian Federation, there is also a decrease in the level of STIs. In particular, the incidence

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of all forms of syphilis significantly decreased from 21.2±0.37 (in 2016) to 19.5±0.10 (in 2017), gonococcal infection from 14.4±0.09 (in 2016) to 11.1±0.09 (in 2017) ($p < 0.05$). There is also a decrease in the primary incidence of HIV infection in the Russian Federation from 59.2±0.20 (in 2016) to 58.4±0.20 (in 2017) per 100 thousand population ($p < 0.05$). In addition, the frequency of occurrence of risky sexual behavior – a form of human sexual behavior that increases the risk of contracting an STIs — is reduced: early sexual activity, ignorance of how to protect yourself from sexually transmitted infections, frequent changes and the absence of a permanent sexual partner, casual sex, non-use of condoms and other protection method. At the same time, in spite of improving the method of diagnosis and treatment, today there is still a high level of STIs prevalence in the world, and among those who are sick there are people aged between 15 and 29 years old (60-70%)[7,8].

Diagnosis and treatment of STIs and human immunodeficiency virus: Diagnosis and treatment of STIs is carried out in strict accordance with the clinical guidelines, procedures and standards of care. The diagnosis is made on the basis of the international classification of diseases of the 10th revision (ICD-10), class A50-A64 "Sexually transmitted infections", also B20-B24 "Disease caused by the human immunodeficiency virus"[9].

Confirm or refute STIs and infection with the human immunodeficiency virus is possible only on the basis of laboratory tests. It should be remembered that they become informative not immediately after intercourse, but after some time (for each disease it is different - from 3-5 days to several weeks and even up to 3-6 months with a human immunodeficiency virus) from the moment of infection[10].

It is necessary to know that the information on the presence of an STIs and a human immunodeficiency virus in a patient is not allowed to pass on to the attending physician (except for the investigation and court authorities). And any patient who applied for medical care, regardless of the existing disease, has the right to be treated with respect by medical workers[11].

The historical aspect of criminal liability for infection with venereal diseases in Russia: Already in the Soviet period in Russia, the authorities considered it necessary to criminalize the intentional infection with venereal disease. This was due to the reluctance of a number of people with venereal disease to voluntarily perform the prescribed medical procedures. Therefore, already in the first Criminal Code of the Russian Soviet Federative Socialist Republic, enacted on July 1, 1922, article 155 established criminal liability for "knowingly infecting another person with a serious venereal disease", which was punishable by imprisonment for up to 3 years.

A year later, in June 1923, the First All-Russian Congress on the Control of Sexually Transmitted Diseases was held, the participants of which influenced the introduction of changes in Article 155 of the Criminal Code of the Russian Soviet Federative Socialist Republic of 1922, which excluded the words "notorious" and "heavy", and which now looked like this: "For infecting another person with a venereal disease." Thus, the content of the subjective side of the crime has expanded, which is now formed by the intentional and careless infection of another person with a venereal disease, regardless of the method of such infection and the degree of harm to the victim's health.

Having decided that the existing norms do not fulfill their preventive functions, at the insistence of representatives of the Soviet government on August 6, 1926, the Criminal Code of the Russian Soviet Federative Socialist Republic was supplemented by article 155-a, directed against persons suffering from sexually transmitted diseases and leading sexual habits, in the Criminal Code of the Russian Soviet Federative Socialist Republic of 1926 was amended and merged with Article 155 in Article 150 of the Criminal Code of the Russian Council tion of the Federal Socialist Republic. Changes in the disposition of this article were expressed in the fact that a person suffering from a venereal disease should have been aware of the presence of this disease in him[12].

The Great Patriotic War and the occupation of part of Russia triggered a new outbreak of sexually transmitted diseases, which was one of the prerequisites for changing the criminal law norms of this sphere, reflected in the Criminal Code of the Russian Soviet Federative socialist republic of 1960 in article 115, the sanction of which was stricter and wider than the sanction Part 2 of Article 150 of the Criminal Code of the Russian Soviet Federative Socialist Republic of 1926. 10 years later, in 1971, the elements of the crime envisaged by article 115 of the Criminal Code of the Russian Soviet Federative Socialist Republic of 1960 were expanded, and a new

article 1151 was introduced - "evasion of the treatment of venereal disease", continuing after the warning made by medical authorities.

Convicted under articles 115 and 1151 of the Criminal Code of the Russian Soviet Federative Socialist Republic of 1960, amnesties were not subject to. In Part 3 of Article 115 of the Criminal Code of the Russian Soviet Federative Socialist Republic of 1960, for the first time, criminal liability was established for the qualified types of infection of another person with a venereal disease by a person who knew that he had the disease related to the infection committed by a person who had previously been convicted of similar acts, also with infection of two or more persons or a minor. The rapid development of venereology and the identification of new sexually transmitted diseases caused changes in legislation: in accordance with the Decree of the Presidium of the Supreme Council of August 25, 1987 №7612-11 "On measures to prevent the virus from acquiring acquired immunodeficiency syndrome" any person could be diagnosed with acquired immunodeficiency syndrome. Doctors will consider it appropriate. In addition, with the discovery of the causative agent of the new venereal disease "Human Immunodeficiency Virus", on August 31, 1987, Article 115 was supplemented with Article 1152 - infection with the human immunodeficiency virus (Part 1) and infection of another person with the human immunodeficiency virus diseases (part 2). Changes in criminal law related to infection with venereal diseases were not implemented until the current Criminal Code of the Russian Federation was adopted in 1996, which proves that the criminal policy of that period was effective[13].

Qualification of infection with venereal disease and human immunodeficiency virus: Health protection, enshrined in criminal law, is an important part of the Russian state system of protection of the human right to health. Therefore, in the Criminal Code of the Russian Federation there is a separate chapter aimed at protecting the health of citizens, called crimes against life and health. Depending on the nature of the crime, the chapter divides crimes against life, against health, and crimes that threaten health. One of the important chapters in this chapter is the existence of norms separating infection by the human immunodeficiency virus and venereal diseases. The distinction between the elements of a crime between Article 121 of the Criminal Code of the Russian Federation (infection with venereal disease) and Article 122 of the Criminal Code of the Russian Federation (infection with human immunodeficiency virus) is very important, since the danger of human life and social relations in this case is very different, although the order of infection in some points may be common[14].

Responsibility for both articles occurs if the person was aware of the presence of a sexually transmitted disease or human immunodeficiency virus and concealed this fact when entering into sexual relations. The knowledge of the perpetrator about his illness is confirmed by the warning and other data of the medical institution about the presence of the disease. It should also be noted that, according to article 121 of the Criminal Code, a person may be liable not only during the period of the illness and its treatment at home, but also during the period of hospitalization. It is not a reason for exemption from criminal liability if the victim was willing to put himself in danger of being infected with a human immunodeficiency virus or a venereal infection. From the point of view of the subjective side, infection with the human immunodeficiency virus and infection with a venereal disease are characterized by direct and indirect intent[15].

It is impossible to hold a person accountable for criminal negligence, since the law states that the person should have known that he has a human immunodeficiency virus or a sexually transmitted infection. Criminal frivolity occurs when a person assumes that he has cured himself of the disease himself, and believes that the other person will not be infected by contacting him[16]. The presence of a separate norm on the human immunodeficiency virus in the Criminal Code of Russia is due to the particular danger of this infection in comparison with venereal and other diseases. In order for a crime to be infected with a human immunodeficiency virus it can be considered complete, it is not required that it develop into an acquired immunodeficiency syndrome. Moreover, it is not even necessary for the virus to enter the victim's body because Russian law already provides for the responsibility for creating the conditions for the victim to become infected. The objective side of paragraph 1 of Article 122 of the Criminal Code - knowingly putting another person in danger of being infected with a human immunodeficiency virus, can be equally expressed in inaction and action. The source of the disease in cases stipulated by article 122 of the Criminal Code of Russia are people in whose blood the virus circulates. There are certain features of the legal qualification of a crime in accordance with Article 122 of the Criminal Code of Russia. So, part 1 of the article

provides that responsibility comes at the time of putting in danger. Part 2 and part 3 of the article indicate that liability arises after the act of infection. And part 4 of the article indicates that responsibility occurs if a special subject infects the victim due to negligent performance (or non-performance) of official duties[17].

Conclusion

It must be remembered that the prevention of STIs and infection with the human immunodeficiency virus depends on internal moral attitudes (orientation toward a later start of sexual activity, refusal of premarital and extramarital intimate relations). The motive for the start of sexual life should be your own conscious decision, and not pressure from a partner, fear of losing him, desire to please him and preserve the relationship. In such cases, it is necessary to clearly and clearly discuss the intimate side of the relationship and, in cases of reluctance to begin sex with this partner, refuse.

Despite the fairly widespread STI and the occurrence of infection with human immunodeficiency virus, the implementation of the simplest recommendations guarantees the safety of intimate life and preservation of health. A clear legal regulation of actions of a sexual nature, associated with the risk of infection or entailing infection with sexually transmitted infections, helps to curb their distribution. It is essential for maintaining the sexual health of people of young and mature age, which is an important resource of any country.

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Effect of Non-Computerized Cognitive Remediation and Risperidone to Improve Disability Function in Schizophrenia

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Abstract

The aim of the study was to find out the effect of non-computerized cognitive remediation and risperidone therapy to improve cognitive function and disability condition in schizophrenia patients. This study was an experimental research design, with fourteen participants divided into two group as the experimental group and the control group. The experimental and control groups both received Risperidone. In addition, the experimental group was given the non-computerized cognitive remediation (CR).The non-computerized cognitive remediation will be carried out in 12 sessions (3 sessions per week) using mainly paper and pencil tasks and is based on cognitive strategy instruction. Moreover, all samples will be measured for PANSS (Positive and Negative Symptom Scale), WHODAS 2.0 (World Health Organization Disability Assessment Schedule), and SCoRS Vi (Schizophrenia Cognition Rating Scales Indonesian Version) scores. As the results, both experimental and control group showed a significant decrease in the SCoRS Vi and WHODAS 2.0 score (p=0.001). However, the experimental group showed greater improvement compared to the control group. Synergistic effect of Non-computerized Cognitive Remediation and Risperidone can improve disability condition in schizophrenia patients.

Keywords: *Schizophrenia, Non-computerized Cognitive Remediation, Risperidone, Disability.*

Introduction

Schizophrenia is a chronic mental illness characterized by hallucination, delusion and thought disorder(as well as cognitive and psychosocial impairments.[1] Cognitive deficits are core features of schizophrenia, contribute substantially to poor functional outcome of the patients and are likely as important as positive and negative symptoms for clinical treatment of the illness.[2] Schizophrenia is a psychotic disorder that affects about 26 million people around the world. It is typically diagnosed in early childhood and mostly persist through-out people's live. Several long-term follow up studies have challenged the view about schizophrenia poor outcome and proved that varying degrees of improvement is still one of the main causes of disability worldwide.[3] Patients with schizophrenia have difficulty succeeding at school, obtaining or maintaining a job, having social relationship, living independently and even for some taking care of their basic daily needs.[4]

The decline occurring in schizophrenia had been broadly classified as something related to neurocognition and social cognition.[5] While all domains of cognition are affected in schizophrenia, there are selective areas of increased impairment – particularly verbal and visuo-spatial memory, attention, executive function and speed of processing.[6] Antipsychotic drugs can relieve the main symptoms of schizophrenia but have no therapeutic effect on this cognitive impairment and the overall outcome is generally unsatisfying which explains the increasingly widespread use of cognitive remediation for schizophrenia.[7,8] Alternate theories of schizophrenia point to neurodevelopmental abnormalities as a potential cause. Brain-derived neurotrophic factor (BDNF) is a neurotrophic factor essential for development of the

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central nervous system and modulation of neuronal connections that may be involved in the pathophysiology of schizophrenia and its associated cognitive impairment, especially immediate memory.[9,10]

In 20 clinical trials for cognitive enhancement, atypical antipsychotic medication moderately improved some aspects of cognitive functioning in patients with schizophrenia. Next, the influence of neurocognitive rehabilitation on neurocognitive functioning come to attract attention. Cognitive remediation was associated with a medium effect size for cognitive performance.[11] Then, are there any synergistic effect of cognitive remediation and antipsychotic that can improve disability in schizophrenia patients? It was generally thought that atypical antipsychotic would improve neurocognitive functioning but some published reports suggest that the magnitude of neurocognitive functioning for antipsychotic is lower than previously expected.[11] Thus, developing medications and cognitive therapies to treat the cognitive deficits associated with schizophrenia is a high priority.[12,13]

According to the WHO-ICF, disability encompasses impairments of body functioning, activity limitations, or participation restriction, arising as interconection result between health condition and contextual factors. A person with schizophrenia, might experience disability due to impairment of thought or perceptual functions.[3] In previous research, showed the significant improvement(p=0,002) in cognitive function after given 12 session of non-computerize cognitive remediation in schizophrenia treated with atypical antipsychotic.[14] However, the study did not link the benefits or impact of cognitive function improvement with disability condition. Therefore, we were interested to conduct further research to determine the effect of non-computerized cognitive remediation and risperidone on disability improvement in schizophrenia patients.

Materials and Method

Location and Time: The study was conducted at the Rumah Sakit Khusus Daerah (RSKD) Hospital in Makassar, South Sulawesi, Indonesia,from April to July 2018.

Ethical Clearance: Ethical approval for the study was given by the Ethics Commission on Biomedical Research in Humans, Medical Faculty of Hasanuddin University, Makassar, Indonesia.

Participants: The participants were diagnosed schizophrenia by psychiatric, in a stable state (PANSS score 50-70), irrespective gender or race, age 18 to 45 years,minimal level of education is elementary school, no evidence of head injury or organic disorder,who were hospitalized in Rumah Sakit Khusus Daerah (RSKD) Hospital. The participants were taken from April 2018 until July 2018 by Consecutive sampling method.

Procedure: All participants gave informed written consent (N=14). All assessments were carried out by medical graduation. Sociodemographic data were collected from case note, nurses and participants. All participants were assessed on the measures of PANSS, WHO DAS 2.0 and SCoRS Vi beforeand 4 weeks postbaseline. Every participant received (TAU) treatment as usual (Risperidone) and randomly assigned to receive non-computerized cognitive remediation. The participants were divided into 2 groups, experimental group (TAU plus CR, n=7) and control group (TAU, n=7).

Interventions: Participants in experimental group have received CR for 12 sessions (3 sessions per week). The intervention should have been performed in a clinical setting by a medical graduation with qualification in CR. The CR was either a paper and pencil format and the length of therapy should be from 45 minutes to 1 hour.

Data Analysis: All data were presented in mean value and statistically analyzed with SPSS computer software. The data were analyzed using Mann-Whitney test and Wilcoxon test, with the significant value was determined if the $p< 0.05$.

Results

The study was conducted at the Rumah Sakit Khusus Daerah (RSKD) Hospital in Makassar, Indonesia, from April to July 2018. In Table 1, most subjects in experimental group were male (57,1%), in contrast with mostly female in control group (57,1%). Most subjects were between 30 – 39 years old (57,1%) in both groups. In the experimental group, the education level was equally for Elementary School and Senior High School (42,9%) and in control group was mostly Elementary School (57,1%). For occupation, unemployed subjects were 57,1% in the experimental group and 85,7% in the control group. For marital status, unmarried were 42,9% in the experimental group and 85,7% in the control group. Moreover, for the diagnosis, schizophrenia unspecified (F20.9) was dominated (57,1%) in both groups.

Table 1. Subjects Profile

Variabel	Experimental Group		Control Group	
	N	(%)	n	(%)
Gender				
Male	4	(57,1)	3	(42,9)
Female	3	(42,9)	4	(57,1)
Age				
≤ 20	0	(0)	0	(0)
21-29	2	(28,6)	1	(14,3)
30-39	3	(42,9)	4	(57,1)
≥ 40	2	(28,6)	2	(28,6)
Education				
Elementary School	3	(42,9)	4	(57,1)
Junior High School	1	(14,3)	1	(14,3)
Senior High School	3	(42,9)	2	(28,6)
Occupation				
Employee	3	(42,9)	1	(14,3)
Unemployment	4	(57,1)	6	(85,7)
Marital Status				
Married	4	(57,1)	1	(14,3)
Unmarried	3	(42,9)	6	(85,7)
Schizophrenia Subtype				
Paranoid Schizophrenia	3	(42,9)	3	(42,9)
Schizophrenia Unspecified	4	(57,1)	4	(57,1)

In Table 2,we conclude the comparison of SCoRS Vi and WHODAS 2.0 scores in the experimental group and control group. In the experimental group, the baseline SCoRS Vi scores was higher than the scores on the fourth week. Meanwhile, WHODAS 2.0 scores decreased on the fourth week of treatment and this was also the same in the control group. Using the Independent sample t-test analysis, the baseline SCoRS Vi scores in both groups, did not show any significant difference (p=0,056), as well as the result on the fourth week of treatment (p=0,831). There was also no significant difference in the baseline of the WHODAS 2.0 scores between the two groups (p=0,094), but there was a significant difference in WHODAS 2.0 scores on the fourth week in both groups (p=0,000).

Table 2. The Comparison of SCoRSVi and WHODAS 2.0 Scores in Experimental and Control Group

Scale	N	Treatment Group		Control Group		P
		Median (Minimum-Maksimum)	Mean ± SD	Median (Minimum-Maksimum)	Mean ± SD	
SCoRS Vi Baseline	7	72 (68-76)	71.7143 2.49762	65 (60-75)	66.1429 6.51738	0.056
SCoRS Vi On the 4th wk	7	63 (55-70)	61.8571 5.36745	62 (55-70)	62.5714 6.77882	0.831
WHODAS 2.0 Baseline	7	37 (30-40)	36.571 3.4572	39 (36-45)	39.714 2.9841	0.094
WHODAS 2.0 On the 4th wk	7	28 (20-35)	27.8571 4.52506	37 (34-40)	37.1429 2.34013	0.000

In Table 3, in the experimental group, there was a significant difference in SCoRS Vi and WHODAS 2.0 scores at the baseline and after fourth week of treatment (p=0,001).

Table 3. The Differences of SCoRS Vi and WHODAS 2.0 Scores in Experimental Group

Scale	n	Experimental Group		P
		Median (Minimum-Maksimum)	Mean±SD	
SCoRS Vi Baseline	7	72 (68-76)	71.71±2.49	0.001
SCoRS Vi On the 4th wk	7	63 (55-70)	61.85±5.36	
WHODAS 2.0 Baseline	7	37 (30-40)	36.57±3.45	0.001
WHODAS 2.0 On the 4th wk	7	28 (20-35)	27.85±4.52	

In Table 4, in the control group, there was also a significant difference in SCoRS Vi and WHODAS 2.0 scores at the baseline and on the fourth week of treatment (p=0.001).

Table 4. The Differences of SCoRS Vi and WHODAS 2.0 Scores in Control Group

Scale	n	Control Group		P
		Median (Min-Max)	Mean±SD	
SCoRS Vi Baseline	7	65 (60-75)	66.14±6.5	0.001
SCoRS Vi On the 4thwk	7	62 (55-70)	62.57±6.77	
WHODAS 2.0Baseline	7	39 (36-45)	39.71±2.98	0.001
WHODAS 2.0 On the 4thwk	7	37 (34-40)	37.14±2.34	

In Table 5, there were an improvement of SCoRS Vi and WHODAS 2.0 scores and were equally significant (p=0,003) in both groups. However, the improvement of SCoRS Vi and WHODAS 2.0 scores in the experimental group was higher than in the control group. It means that the administration of Risperidone in combination with non-computerized cognitive remediation showed a better outcome compared to Risperidone only.

Table 5. The Deviation of SCoRS Vi and WHODAS 2.O Scores in Experimental and Control Group

Scale	n	Control Group		Experimental Group		P
		Median (Min-Max)	Mean ± SD	Median (Min-Max)	Mean ± SD	
Deviation SCoRS Vi	14	3 (2-5)	3,5 (1,39)	8 (5-16)	9,8 (4,37)	0.003
Deviation WHODAS 2.0	14	2 (2-5)	2,5 1,13	9 (3-16)	8,7 (4.11)	0.003

Discussion

Cognitive impairment has emerged as an important new target in schizophrenia therapeutics in light of evidence that cognitive deficits are critically related to the functional of disability that is characteristic of the illness.[15] Schizophrenia has a range of cognitive deficits that may evolve from decreased BDNF.[10] This study showed thatthere was a significant decrease in the SCoRS Vi score, both in the treatment and control groups, as well the WHODAS 2.0 score. However, the improvement in the experimental group was greater than in the control group.

One of the targets, the treatment of schizophrenia is improvement of cognitive function. Cognitive remediation is a therapeutic process to increase or improve the capacity of individuals to process and use information, and enable improvement of daily life functioning.[16,17] Cognitive remediation is a training activity on the cognitive function of schizophrenia patients. By giving cognitive remediation, it will indirectly improve the cognitive function of schizophrenia patients. Thus, it will improve the disability of the schizophrenia patient, especially in the daily life functioning (such as bathing, dressing and participating in other group activities).

Cognitive remediation is the gold-standard practice to address cognitive deficits in schizophrenia.[18]

In this study, it appeared that both the experimental and control group had the improvement of the SCoRS Vi and WHODAS 2.0scores and were equally significant (p=0.005). However, the degree of improvement in the experimental group was greater than in the control group. It meant that the improvement of SCoRS Vi and WHODAS 2.0 scores was better with the addition of remediation compared to risperidone treatment only. The scores of SCoRS Vi and WHODAS 2.0 were improved after 12 sessions of non-computerized cognitive remediation which was given 3 times per week for 4 consecutive weeks. Previous study showed that addition of non-computerized cognitive remediation could influence neurobiological changes.[19] It was reported that patients receiving the non-computerized cognitive remediation showed an increase in BDNF serum levels and activation of the inferior frontal gyrus which was assessed through fMRI examination compared to the control group.[17,18] This result was consistent with the results of other studies, showed that BDNF levels began to increase in the second week,[20] and reached high levels at the end of the third week.[21] Brain derived neurotropic factor (BDNF) is considered to a putative biomarker for cognitive recovery in schizophrenia.[22]

Conclusions

This study concluded that the addition of risperidone, in combination with 12 sessions of non-computerized cognitive remediation was better to improve the disability condition in schizophrenia patient. We suggested that the non-computerized cognitive remediation therapy to be given in addition with risperidone treatment. Limitations in this study are that it is only examined the diagnosed type of schizophrenia which did not represent to all types of schizophrenia and that some participants were not interested in remediation process.

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Ethical Clearance: Ethical approval for the study was given by the Ethics Commission on Biomedical Research in Humans, Medical Faculty of Hasanuddin University, Makassar, Indonesia.

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The Effect of Olanzapine on the Improvement of the Clinical Symptom of Schizophrenia

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Abstract

Administration of atypicalantipsychotics (risperidone, olanzapine and clozapine) can improve cognitive dysfunction which occurs in schizophrenia patients. This study was aimed at analyzing the effect of olanzapine on the improvement of clinical symptom (the positive and negative symptoms) in schizophrenia patients. The study was observational with analytic approach on inpatient and outpatient schizophrenia patients in Wahidin Sudirohusodo Hospital and its networking. Subjects comprised of 30 samples who were divided into two groups: the risperidone group which consisted of 15 subjects and the olanzapine group which consisted of 15 subjects. The positive and the negative Symptom Scale (PANSS) wasused to evaluate the psychopathological symptoms. The results showed that improvement of clinical symptom based on the decrease of the positive symptom of thePANSS was significant ($p<0.05$) since the 2nd week in both groups. However, comparison of the changes of the positive symptom of the PANSS after medical treatment showed that the decrease of the positive symptom of the PANSS was greater in the risperidone group compared to the olanzapine group ($p<0,05$). As for negative symptom of the PANSS between the two treatment groups showed that the decrease of negative symptom of the PANSS was significant ($p<0.05$) since the 2nd week.

Keywords: *Risperidone, olanzapine, clozapine, positive and negative symptoms, Schizophrenia.*

Background

The course of schizophrenia consists of three phases. The first phase is the acute phase, characterized by the emergence of positive and negative symptoms, then followed by a stabilization phase, characterized by the relief of a symptom, and then a stable phase, characterized by reduced symptom severity.[1] Schizophrenia is a chronic, severe, pervasive mental disorder, which is characterized by hallucinations, delusions, and impairments in reality assessment. This disorder has a profound and influential impact on many lives and ultimately affects the quality of life of patients.[5,2] Several studies have been conducted to compare the advantages of atypical antipsychotics, since atypical antipsychotics have a brood effect in reducing psychotic symptoms with lower extra pyramidal side effects, leading to a better quality of life than typical antipsychotics.[3] Until now, schizophrenia was known as chronic disease. At the beginning, the goal of therapy is to control positive and negative symptoms in schizophrenia. A data published in 2013 showed that the prevalence of severe mental disorders in Indonesia such as schizophrenia reached around 400,000 people or 1.7 per 1,000 population, overall there was 1% of the population in the world who suffered from schizophrenia.[7]

Oral atypical antipsychotics are considered as the first line treatment, especially for people with newly diagnosed schizophrenia.[9] Atypical antipsychotics are also referred to as second generation antipsychotic (SGA). Included in this class of drugs are risperidone, olanzapine, quetiapine, clozapine and ziprasidone. SGA can suppress positive symptoms, improve cognitive dysfunction, improvesymptom which are refractory to

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typical antipsychotic treatment by blocking more 5HT2A receptor than dopamine inmesocortical pathway. SGA also blocks D2 receptors, resulting in more dopamine being released in the mesocortical pathway and causing an improvement in negative symptoms of schizophrenia. However, the affinity of each drug varies with various types of neurotransmitter receptors which in turn give different therapeutic profiles.[10,11,12]

Risperidone can improve schizophrenia, improve mood in schizophrenia and bipolar disorder. Serotonin has an important role in influencing dopamine but has different effects on each dopamine pathway. Serotonin inhibition occurs in the mesocortex pathway resulting in the release of dopamine in the body cells and axon terminal at post-synapse. This is why risperidone could improve negative symptom.[10]Lately, the use of atypical antipsychotic drugs was more often, with minimal side effect and could improve the positive and negative symptoms of schizophrenia patients.

Previous research[6,8]compared the administration of risperidoneand olanzapine therapy in schizophrenic patients. The results showed improvement for clinical symptoms of schizophrenia patients, especially the negative symptoms of patients who received olanzapine therapy compared to those who received risperidone therapy, meanwhile the administration of risperidone showed improvement in positive symptoms of schizophrenia compare to those who received olanzapine therapy. Since it is importance to determine the right antipsychotic from the beginning of therapy to ensure a good response for the improvement of symptoms of schizophrenic patients, researchers were interested in comparing the effectiveness of the two types of atypical antipsychotics most commonly used in Makassar, which arerisperidone and olanzapine. So far, there had never been any research on the comparison of these two types of drugs based on the positive and negative symptoms of general psychopathology of schizophrenia.

Materials and Method

Location and Time of Research: The study was conducted at Wahidin Sudirohusodo Hospital and its network and from June to August 2018. This study was an analytic observational study. Subjects of the study were schizophrenia patients who were inpatient and outpatient who met the inclusion and exclusion criterias.

Method of data collection: Every schizophrenia patients who met the inclusion criteria was included in the study and data was taken including name, gender, age, last education, occupation,history of the objects previous diseases. The subjects were divided into two groups, risperidone group treatment (group A), and olanzapine group (treatment group B).Each objects from both groups were assessed for PANSS scores before being given therapy with olanzapine or risperidone. The positive symptom of the PANSS and the negative symptom of the PANSS scores were assessed for both groups in the 4th and 8th week.

*All data wa*s processed and analyzed by statistic program.

Results

Thirty subjects joined the study, consist of fifteen subjects who were given risperidone and fifteen subjects who were given olanzapine. The risperidone group was given 2 mg each 12 hours orally and the olanzapine was given10 mg each 24 hours orally. Measurement of PANSS scores for each subject was carried out at baseline, on the 2nd week,on the 4th week and on the 8th week of therapy.

The change of the positive symptom of the PANSS score inrisperi done group (A) andolanzapine group (B) by the Independent T-test showed that the positive symptom of the PANSSwas greater in group A than in group B significantly ($p < 0.05$), which was respectively 14.6% vs 8.5% on the 2nd week, 26.1% vs 19.1%.on the 4th week and 40.1 vs 31.0 on the 8th week. Result of the paired T-test for each group showed a significant decrease of the negative symptom of the PANSS ($p < 0.05$) since the 2nd week, in both groups. The longer the treatment, the greater the changes of the positive symptom of the PANSS which were 14.3% vs 11.5% on the 2nd week, 32.8% vs 24.3% on the 4th week and 48.1% vs 36.1% on the 8th week respectively.

Table 1. Comparison of Positive Symptom of the PANSS and Negative Symptom of the PANSS at Various Lengths of Treatment

Variable	Length of Treatment	Group		P*
		A	B	
		Mean(SD)% Changes	Mean(SD)% Changes	
Positive PANSS	the 2nd week	14.6(8.6)%	8.5(5.7)%	0.029
	the 4th week	26.1(8.4)%	19.1(9.1)%	0.036
	the 8th week	40.1(11.7)%	31.0(8.9)%	0.024
Negative PANSS	the 2ndweek	14.3(8.4)%	11.5(7.1)%	0.318
	the 4th week	32.8(9.3)%	24.3(5.6)%	0.008
	the 8th week	48.1(11.1)%	36.1(6.9)%	0.001

* Paired T-test. A: risperidone group, B: olanzapine group. **Source:** Primary Data, 2018.

Paired T test was used to see change of the positive symptom of the PANSS in the two groups because the data was distributed normally. There was a significant decreased of the positive symptom of the PANSS ($p < 0.05$) since the 2nd week in both groups. The longer the treatment, the greater the changes of the positive symptom of the PANSS, which were 14.6% vs 8,5% on the 2nd week, 26.1% vs 19.1% on the 4th week and 40.1% vs 31.0% on the 8th week respectively.

Table 2. The Effects of Both Treatment Groups on Positive Symptom of the PANSS Changes in Various Lengths of Treatment

Group	Length of Treatment	Decreases of positive PANSS			P*
		PANSS Value	Changes	% Changes	
A	the 2nd week	24.33(8.36)	3.73(3.6)	14.6(8.6)%	0.001
		20.60(6.87)			
	the 4th week	24.33(8.36)	6.67(3.96)	26.1(8.4)%	<0.001
		17.67(5.51)			
	the 8th week	24.33(8.36)	10.07(4.71)	40.1(11.7)%	<0.001
		14.27(4.96)			
B	the 2nd week	21.20(7.89)	2.13(1.51)	8.5(5.7)%	<0.001
		20.87(6.42)			
	the 4th week	21.20(7.89)	4.47(2.48)	19.1(9.1)%	<0.001
		18.53(6.19)			
	the 8th week	21.20(7.89)	7.27(2.99)	31.0(8.9)	<0.001

* Paired T-test. A: Risperidone group, B: Olanzapine group. **Source:** Primary Data, 2018.

Result of the paired T-test for each group showed a significant changes of the negative symptom of the PANSS ($p < 0.05$) since the 2nd week. In both groups the longer the study, the greater the change of the positive symptom of the PANSS which were 14.3% vs 11.5% on the 2nd week, 32.8% vs 24.3% on the 4th week and 48.1% vs 36.1% on the 8th week respectively.

Table 3. Effects of Both Treatment Groups on Negative Symptom of the PANSS Changes in Various Lengths of Treatment

Group	Observation	Decrease of Negative PANSS			P*
		Values	Changes	% Changes	
A	the 2nd week	20.27(6.27)	2.80(2.40)	14.3(8.4)%	<0.001
		17.47(5.95)			
	the 4th week	20.27(6.27)	6.53(2.80)	32.8(9.3)%	<0.001
		13.73(5.04)			
	the 8th week	20.27(6.27)	9.93(4.71)	48.1(11.1)%	<0.001
		10.33(3.58)			
B	the 2nd week	21.20(7.89)	2.40(1.40)	11.5(7.1)%	<0.001
		18.80(7.19)			
	the 4th week	21.20(7.89)	4.93(1.58)	24.3(5.6)%	<0.001
		16.27(6.64)			
	the 8th week	21.20(7.89)	7.60(3.02)	36.1(6.9)%	<0.001

* Paired T-test. A: Risperidone group, B: Olanzapine group. **Source:** Primary Data, 2018

The difference in total PANSS score between the two groups was consistent ($p<0.05$). Comparison of the changes in the total PANSS score in groups A and B by the Independent T-test showed a reduction of total PANSS in both groups ($p > 0.05$).

Table 4. Effects of Both Treatment Groups on Total PANSS at Various Lengths of Treatment

Group	Observation	Decrease in Negative PANSS			P*
		Value	Change	% Change	
A	the 2nd week	105.4(18.8)	12.8(6.3)	11.8(5.0)%	<0.001
		92.6(15.7)			
	the 4th week	105.4(18.8)	23.6(7.6)	21.5(4.9)%	<0.001
		82.3(14.0)			
	the 8th week	105.4(18.8)	32.1(9.0)	30.0(4.3)%	<0.001
		73.2(11.5)			
B	the 2nd week	74.2(21.3)	11.7(8.0)	62.5(17.9)%	<0.001
		62.3(17.9)			
	the 4th week	74.2(21.3)	20.5(9.4)	53.7(15.7)%	<0.001
		53.7(15.7)			
	the 8th week	74.2(21.3)	28.4(2.5)	45.8(14.4)%	<0.001
		45.8(14.4)			

Discussion

This study showed that risperidone and olanzapine were both effective for the positive symptoms and the negative symptoms, but risperidone was superior in dealing with both positive and negative symptoms. Olanzapine, a thienobenzodiazepine derivative is an atypical antipsychotic drug which shows affinity for D1-D5 receptors, serotonergic receptor (5HT2, 3, 6), muscarinic receptors (subtypes 1-5), adrenergic receptors (alpha 1-2), and histaminergicreceptor (H1). Structurally, this drug resembles clozapine but has little difference in terms of its affinity. This drug is weaker than clozapine as alpha 1 and alpha 2 adrenergic agonists, and is slightly different as D2, D4, or 5HT2A receptor antagonists.[4]

Paired T-test was used to see the changes in the positive PANSS for both groups, and each group showed a significant decrease in positive PANSS ($p < 0.05$)on the 2nd week of therapy in both groups. The longer the treatment, the greater the changes in the positive symptom of the PANSS score,which were 14.6% vs 8.5% on the 2nd week, 26.1% vs 19.1% on the 4th week and 40.1% vs 31.0% on the 8th week of study. Risperidone and olanzapine improved of the positive symptoms inboth groups (risperidone group and olanzapine group) starting from the 2nd week to the 8th week ($p = 0.001$).

When the Independent T-test was used to see the difference of the positive symptom of the PANSS score between the group given risperidone and the group given olanzapine, different results were obtained. The decrease of the positive PANSS was greater in group A (given risperidone) than in group B (given olanzapine) significantly ($p < 0.05$)which were 14.6% vs 8.5% on the 2nd week, 26.1% vs 19.1% on the 4th week and 40.1% vs 31.0%.

The changes in the positive symptom of the PANSS score was higher in therisperidone group since the 2nd week ($p = 0.029$) and there were more clinical changes in the positive symptoms in the risperidone group compared to the olanzapine group onthe 8th week. This finding was consistent with previous study,[5] where risperidone have a greater affinity for D2 than olanzapine.

The paired T-test results for each group along the study showed a significant decrease in the total PANSS scores ($p < 0.05$), seen from the 2nd week for both groups. This suggests that risperidone and olanzapine were equally effective for the negative symptoms. It was seen that the longer the therapy was given, the greater the changes in the negative symptom of the PANSS, which were 14.3% vs 11.5% on the 2nd week, 32.8% vs 24.3% on the 4th weeks and 48.1% vs 36.1% on the 8th weeks.

This finding was not in consistent with the publication results,[6]on which those who received olanzapine was better for the negative symptoms compared to risperidone since the first 3 months of treatment. This might becaused by different sampling method, different subtypes of schizophrenic, where in this study most of the subjects were paranoid schizophrenia with positive symptoms dominated over negative symptoms and simplex schizophrenia with negative symptoms dominated over the positive symptoms thus affecting the assessment results. Another thing that might affect this outcome was the sampling which combined inpatients and outpatients, in where hospitalized patients were more often in acute phase and predominated with positive symptoms compared to the outpatients. In addition, the outpatients had more family attention and support than those who were hospitalized, thus affecting the results of the assessment of the negative symptoms. Due to the limitations of the study, were the author's ability, time of study and costs. There were several weaknesses in this study,the PANSS score was not measured regularly every week due to clinical symptoms of schizophrenia, and this study did not examine the side effects of medication and drug effects that was used to minimize the side effects.

Conclusions and Recommendations

This study showed that risperid one and olanzapine were effective for both the positive and the negative symptoms, but risperidone was better for both positive and negative symptoms. Subject who received risperidone experienced more positive and negative symptoms improvement compared to olanzapine. The researchers suggested that further studies should be carried out with bigger samples size and longer observation times. It was necessary to differentiate the treatment status of patients taken as a subjects whether they were outpatients or inpatients.

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Study of Some Virulence Factors of Candida Albicans Causing Intestinal Infection

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Abstract

The incidence of systemic candidiasis which is caused by *Candida albicans* has increased so the present study sheds light on detecting some virulence factors of *Candida albi*cans like production of phospholipases and proteinases, besides the adherence on epithelial cells (from human mouth) and drug tolerance were concerned. Proteinase enzyme was produced by 20 *C.albicans* isolates (47.62%) out of 42 isolates. On the other hand, 18 out of 42 (42.86%) isolates of *C.albicans* could produce the phospholipase enzyme. The ability of the isolates for attachment onto the surface of epithelial cells was studied and found that 39 isolates of *C.albicans* could adherence epithelial cells and 20 isolates recorded percentage 95- 98%. As the resistance to antifungals concerned, we found that 32 isolates of *Candida* were resistant to nystatin. Amphotericin B was the most effective against all isolates of *Candida*. Microscopic examination results of histological section taken from rats' intestine tissues that artificially infected with *C.albicans* which included degeneration, necrosis, hemorrhage.

Keywords: *Virulence factors, Candida albicans, Intestinal infection.*

Introduction

The fungal infections caused by yeasts has increased over the past several decades. Among them, the imperfect yeast *Candida albicans* and several related *Candida* species are importance as opportunistic pathogens in immuno compromised hosts and may cause life-threatening infections.[1] The ability of *C. albicans* to infect host is supported by a wide range of virulence factors so that *C.albicans* shows various mechanisms that are suggestive of virulence such as ability to form hyphae (germ tube formation and pseudo hyphae), capacity to adhere to mucosal surfaces; produces hydrolytic enzymes; proteinases which hydrolyze peptides and phospholipases which hydrolyze phospholipids [2].*C. albicans* is polyphonic. *C. albicans* grows as ovoid "yeast" cells,when cultured in standard yeast laboratory medium, however, mild environmental changes in temperature and pH can result in a morphological shift to pseudo hyphal growth. When *C. albicans* cells are grown in a medium that closed to the physiological environment of a human host, they grow as "true" hyphae. These structures are often observed in invadingt issue[3-4]. *C. albicans* can cause two types of infections in humans: superficial infections and life-threatening systemic infections[5]. Adherence of *C. albicans* to host epithelial cells is a first step in the infection process, it is essential for colonization and mucosal disease. Colonization of mucosal surfaces is lead to disseminated Candidiasis [6].

Materials and Method

One hundred an of stool samples were taken from patient with intestinal infection during the period of first of June 2015 till the end of April 2016. All samples were inoculated on the suitable culture media including (SDA, MRS, CHROM) agar. All plates were incubated aerobically at 37°C for 24 hr.

Yeast Identification: Single colonies were isolated from primary positive cultures and identified according to the criteria of [7], that were included the following tests: Morphological tests, germ tube test, production of chlamydospore, Gram stain, biochemical test sugar fermentation and assimilation test Chromogenic agar culture, growth at 45°C, API Candida system Diagnostic kit of *Candida*

Virulence Factors Tests:

Detection of protease production: *Candida albicans* isolates were inoculated the medium Trypticase Soya agar, after then the medium was incubated at 37° C for (24-48) hr., positive result it was observed when clear zone around the colony was appeared[8].

Detection of Phospholipase production: Yeast suspension was inoculated the Egg- Yolk agar medium after then the medium was incubated at 37° C for (24-48)hr., positive result it was observed when clear zone around the colony was appeared (8).

Adhesion assay:

1. **Preparation of yeast suspension**

- Apart of yeast culture which growing on SDA in aged 24 hrs was the transferred to test tubes, the test tubes containing SDB and incubated at 30°C for 24 hrs.
- The yeast culture centrifuged at 500 cycle/minute
- The precipitated cells were washed by PBS then centrifuged them and washing three times
- PBS solution was added to precipitate cells until the concentration of cells became 1×10^5 by using heamocytometer[9].

2. **Preparation of epithelial cells suspension**

- By using cotton swabs the epithelial cells which found in buccal cavity endothelial cells were obtained from healthy women after washing their mouth by using sterile normal saline three times, then cotton swabs infused in PBS for 10 minutes
- The solution contain epithelial cells centrifuged at 300 cycle/minute and then washed it with PBS three times
- The PBS was added to precipitate cells to preparation epithelial supernatant with concentration 1×10^4 by using heamocytometer.
- The 0.5ml of candida suspension and 0.5ml of epithelial cells suspension were mixed in test tube and incubated at 37°C for 1h in Shaking incubator 40 rpm.
- The mixture was centrifuged and washing with PBS three times then PBS added to precipitate cells to prepared supernatant.
- The supernatant was centrifuged at 1000 cycle/ minute for 5 minutes, then PBS added to precipitate cells
- Drop of supernatant cells was taken and spread onto clean slid then let to dry and fixed by flame. The percentage of epithelial cells attached by yeast cells were calculated as flow: Adherence percentage = the number of epithelial cells attached by yeast cells/total epithelial cells × 100. (9).

Susceptibility to antifungal agent's tests: It was used for study yeast susceptibility to antifungal agents Disk diffusion method that by transferred part of colony of yeast were grown in SDA by loop to test tube that contained 5 ml of normal saline and count the fungal cells by using Haemocytometerto obtain concentration 1×10^5, and then transferring 0.1 ml of the yeast suspension has been spread on the surface of Emmons medium plate and left to dry. Antibiotic disks have been placed and incubated for 24 hr. at 37°C, Then the zones of inhibition have been measured using a ruler and compared with the zones of inhibition determined by National Committee for Clinical Laboratory standards (NCCLS, 2003) or [10]

1. **Yeast suspension:** *Candida albicans* that contained most virulence factors obtained from a culture on SDB medium and incubated for 24 hrs. at 37 °C, cells were precipitated by centrifuging and the sediment was suspended in normal saline to result $5x10^5$ cell/ml[11].
2. **Intestine Candida inoculation:** Rats were given $5x\ 10^5$cell/ml in drinking water from day 1 to day 15 induce intestine inflammation. Inoculated control rats were oral gavage inoculated with sterile PBS [11].After 24 hr of injection the rats were divided into four groups each group contain 10 rats, group 1,2 and 3 were prepared to study *Candida* infection and group 4 as control group, animal of each group were killed after (5, 10, and15)days.Then the rat scarified after 15 days and removed intestine tissue then fixed with 10% formalin.

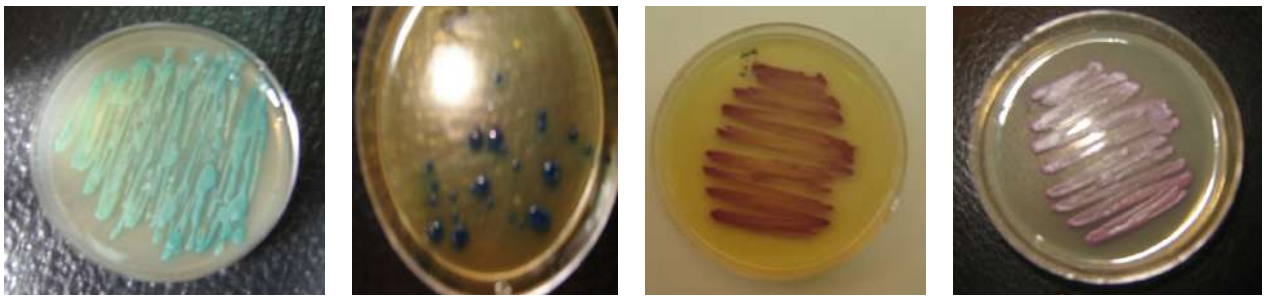
Results and Dissection

Isolation and Identification of Candida spp: Out of 100 stool samples,95 isolates of Candida species were isolated from patient with fungal intestinal infection and diagnostic 8 isolates of can did aspp from 30 stool samples as control group. The types and numbers of these isolates, listed in (Table 1), were identified by using the CHRO Magar, Biochemicaltests, API20.The majority of *Candida* species amongst the Candida isolates were

Candida albicans (44.4%) followed by *C. tropicalis*, *C. krusei*, *C. parapsilosis*and *C.glabrata.* The color used to identify the *Candida spp* figure (1). *C. albicans* isolates produced green smooth-type colonies after incubation for 24, 48 and 72 h. the present study found CA to be useful for the identification of non- *C. albicans* species. This agreed with [12] who found that the chromogenic agar medium can be identification of not only *Candida* species but also othere medically important non *Candida* yeast species, based on the development of coloured colonies.[13] Foundthat Chromogenic *Candida* Agar to be the most effective for distinguishing between different *Candida* species. The identification of clinically relevant yeasts by chromogenic medium is highly reliable and can be used as an accurate alternative to conventional identification method[12].

Table 1: Frequency of isolation of important Candida spp.

Types of Candida	Number of Isolates		
	Healthy (%)	FII	%
Candida. albicans	5(62.5)	42	44.2
Candida glabrata	0(0.00)	4	4.2
Candida tropicals	2(25)	20	21.1
Candida parapsilosis	1(12.5)	11	18.9
Candida krusie	0(0.00)	18	11.6
Total	**8 (100)**	**95**	**100**



A B C D

Figure 1: Candida spp growing on chromogen agar (A: C.albicans, B: C.krusie s, C: C.glabrata)

Detection of virulence factors for *Candida* species:

Adherence ability: The results showed that the ability of *Candida spp* for attachment onto the surface of epithelial cells andshowed that the highest percentage of adherence was for *C.albicans* 98% and fallowed by *C.tropicalis* 95% while the lowest percentage of adherence was for *C.glabrata* 72%. The results showed that 39 isolates of *C.albicans* could adherence on oral cavity epithelial cells and 20 isolates recorded percentage 95- 98% (Table, 2), (Figure, 2).

Table 2: A- Percentage ability of some *candida spp* for attachment onto the surface of epithelial cells. B- Percentage of candida albicans adherence on oral cavity epithelial cells.

A. Percentage ability of some candida spp for attachment onto the surface of epithelial cells.

Types of isolates	Highest of adherence (%)	Lowest of adherence (%)
Candida. albicans	98	85
Candida glabrata	72	48
Candida tropicals	95	77
Candida krusie	88	60
Candida parapsilosis	78	52

B. Percentage of candida albicans adherence on oral cavity epithelial cells

Range (%)	Number of Isolates
95-98	20
90-94	8
85-89	11
Total	**39**

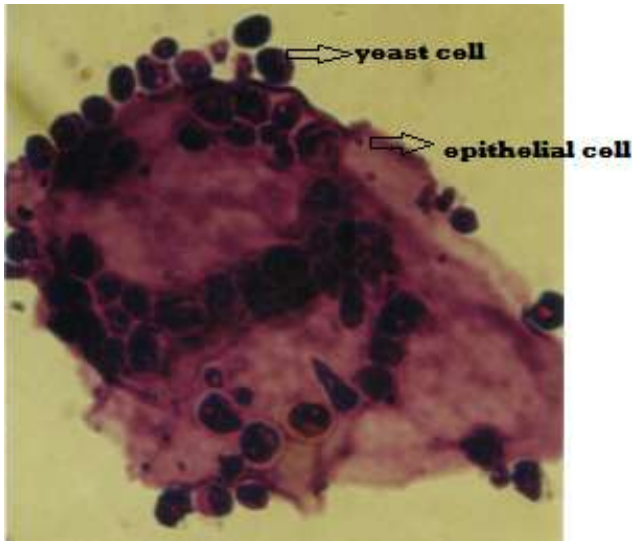


Figure 2: Epithelial cells attached by Candida albicans yeast cells, slid staining by sfranine (Light microscope, 100x).

Resistance of *C.albicans* to antifungal agents: Sensitive test for all isolates of *C.albicans* was done against four antifungal agents (AmphotericineB, Miconazole, Econazole, Nystatine) by cell diffusion method and the results are compared with [10]. *C.albicans* showed the major resistance to Nystatine with percentage 76.19 followed by Econazole 71.43 Miconazole 66.7 and then Amphotericin B 42.86 (Figure,3). The result was close to the result of b[14] who showed that Nystatine had the highest percentage of resistance reached to 57.5% compared with other antifungal agents. The mechanism of resistance will be different depending on the mode of action of antifungal compounds. Cellular and molecular mechanisms supporting resistance against antifungal classes[15-16]. Resistance was probably due to a decrease or lack of ergo sterol content in cell membranes. Mitochondrial dysfunction was one of the possible mechanisms by which azole resistance can occur in *Candida glabrata* and C.*albicans*[17] (Table, 3 A).

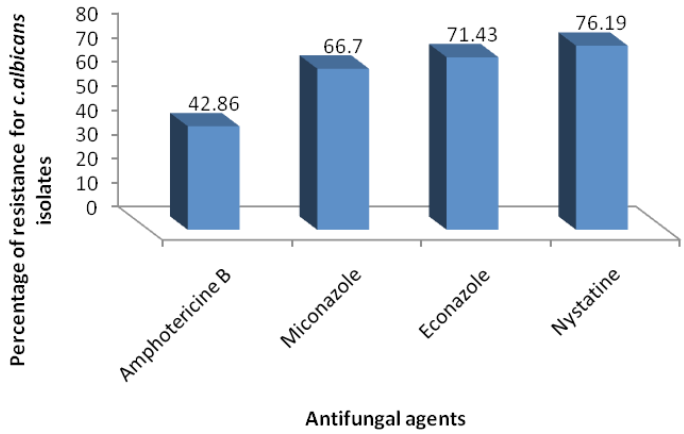


Figure 3: Percentage of antifungal resistance to C.albicans

Production of proteinase and phospholipase enzyme: The results revealed that proteinase enzyme was produced by 20C.albicans isolates (47.62%) out of 42 isolates (Table,3 B). That is similar to the observation[18] who found that proteinase production was also seen in *C.albicans* (82.1%) proteinase activity was detected in *C. albicans,C. tropicalis*, and C. *parapsilosis*[19]. The non-*Candida albicans* produced more proteinase than *C. albicans*. *C. albicans* produced higher levels of phospholipase than non-*Candida albicans* in the study of[19]. The enzyme phospholipase was produced by 18 out of 42 (42.86%) isolates of *C.albicans*. The result is close to the result of [20] who detected Phospholipase activity in 75% (9 out of 12) of the *C. albicans* isolates. Several studies have shown that phospholipase activity is observed only in *C. albicans* strains[21]. However, other researchers described that other *Candida*species such as *C. glabrata*, *C. guilliermondii*, *C. tropicalis*, *C. famata*and *C. inconspicua* secreted smaller amounts of phospholipase[22]. Phospholipase enzyme digests the host cell membrane phospholipid causing cell lysis and changes in the surface features that enhance adherence and consequent infection and hence phospholipase production may be used as one of the parameters to distinguish virulent invasive strains from non-invasive colonies[22].

Table 3: A. Ability of candida albicans to produce proteinase and Phospholipase enzyme. B-Antifungal sensitivity of C.albicans

A. Ability of candida albicans to produce proteinase and Phospholipase enzyme.								
Number	**Amphote-ricin B**	**%**	**Miconazole**	**%**	**Econazole**	**%**	**Nystatine**	**%**
R	18	42.86	28	66.7	30	71.43	32	76.19
S	24	57.14	14	33.3	12	28.57	10	23.81

B. Antifungal sensitivity of C.albicans.				
Types of enzyme	**Positive**	**%**	**Negative**	**%**
Proteinase	20	47.62	22	52.38
Phospholipase	18	42.86	24	57.14

Conclusion

As resistance to fungi involved, it was found that 32 isolates of *Candida* were resistant to nystatin. Amphotericin B was the most effective against all Candida isolates.

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required.

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Correlation between Protein Intake, Parity and Miscarriage History Anemic Pregnant Women in Sukoharjo Regency, Indonesia with Low Birth Weight Incidence: A Case Control Study

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Abstract

Pregnant women need protein intake during their pregnancy, a lack of protein intake is proven to cause low birth weight (LBW). In addition, the condition of anemia during pregnancy, parity, and miscarriage history in previous pregnancy also increases LBW. This study aims to analyze the correlation between protein intake, parity, and miscarriage history anemic pregnant women in Sukoharjo Regency, Indonesia, with LBW incidence. This study used Case Control design. This research was conducted in the Sukoharjo regency from April until June 2018. The respondents were drawn from the population of anemic pregnant women who had given birth in 2016-2018 in Sukoharjo Regency, with a total of 111 respondents, of which 74 were control groups and groups case of 37 people. Data analyzed used Chi-square test with a significance value of $p < 0.05$. Based on the Chi-square test it was found that there was a significant relationship between protein intake of pregnant women p (0,000) with an odds ratio of 0,063, parity p (0,000) with an odds ratio of 0,119, and miscarriage history in anemic pregnant women p (0,000) with odds ratios at 0,339 with LBW incidence in Sukoharjo Regency, Indonesia.

Keywords: *Protein intake, parity, miscarriage history, anemic pregnant women, low birth weight incidence.*

Introduction

Anemia is one of the health problems in the world especially developing countries, it is estimated that 30% of the world population suffers from anemia. Anemia occurs a lot in the community, especially in pregnant women[1]. Survei Kesehatan Rumah Tangga (SKRT) Indonesia states that the prevalence of anemia in pregnant women is 50,5. The large number of anemia pregnant women is in Sukoharjo Regency, where in 2015 there were 1,773 anemia experienced from a total of 13,419 pregnant women or around 13% of the total number of pregnant women[2].

The incidence of anemia during pregnancy greatly affects the process of fetal growth in the womb and how it will be born later, such as premature birth, low birth weight, and other health conditions[3]. Anemia that occurs during pregnancy can increase the risk of poor pregnancy outcomes or how the condition of the baby is born, such as premature birth, low birth weight, small size for gestational age, fetal death, and anemia in infancy[4].

Women who are pregnant need an increase of protein intake during their pregnancy. Active amino acids will be transported across the placenta to meet the needs of the developing fetus. Protein requirements for pregnant women will increase with increasing

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gestational age. Lack of protein intake has been shown to cause low birth weight[5]. Protein is very important and has a high nutritional value because of the amino acids that make it up, where the body must synthesize various proteins and molecules containing nitrogen to support their survival. Each protein is composed of amino acids, according to their patterns and characteristics so they can form a structure. The amino acid will then be absorbed and metabolized in cell[6]. The higher protein intake of pregnant women can prevent LBW[7].

More than 70% cases of LBW in the world due to maternal nutritional intake and environmental factors as external factors, besides that it can also be caused by uterine growth that is not optimal. In developing countries, LBW is one of the biggest causes of rising infant mortality after birth and during its growth period. Infant mortality in the world, recorded 20 times greater in infants who experience low body weight at birth. Babies are said to have a low birth weight if their weight is less than 2,5 kg[8]. Ermawati (2016)'s research showed that there was a relationship between parity and LBW incidence, where the results of the bivariate chi-square analysis showed p (0.01 <0.05)[9]. Impaired fetal growth until the case of fetal death in the last pregnancy is related to the incidence of abortion or a miscarriage history in previous pregnancies experienced by pregnant women. In addition, miscarriage history in previous pregnancy also increases premature birth and LBW[10]. LBW incidence in Indonesia had a percentage of 10,20% in 2013, a percentage of 10% was in Central Java[11] and in 2015 there were 3,90% in Sukoharjo Regency[2], so this study will analyze correlation between protein intake, parity, and miscarriage history anemic pregnant women in Sukoharjo Regency, Indonesia, with low birth weight incidence.

Material and Method

Design of this study used Case Control. Research was conducted in the Sukoharjo Regency in April-June 2018. The sample was taken from the population of anemic pregnant women who had given birth in 2016-2018 in Sukoharjo Regency, then divided into two groups, Control Group was pregnant women who had given birth normal baby and Case Group are who gave birth low birth weight baby.

Total sample is 111 people, control group were 74 respondents and case group were 37 respondents. Sampling method used purposive sampling technique. Data analysis used Chi-square test with a significance value of p <0.05. Authors used several data collection techniques such as the following form filling, where respondents were asked to fill in the forms provided by the author. Like form for pregnant women and informed consent. Then there was an interview to ascertain the correctness of the data filled by respondence to find out parity and miscarriage history based on the MCH Handbook and maternal protein intake during pregnancy with the Semi Qualitative FFQ form.

Findings: Result of the study obtained characteristic data of 111 anemic pregnant women who gave birth in 2016-2018 with criteria for the age of 20-30 years and domiciled in the Sukoharjo regency are:

Table 1. Pregnant Women Characteristic

Characteristic	n (%)	x̄± SD
Age		26,41±3,40
Activity		
Full Housewife	64(57,65)	
Officer	33(29,72)	
Entrepreneur	8(7,20)	
Student	2(1,80)	
Lecturer and Teacher	4(3,60)	
Education		
Elemetary	8(7,20)	
Junior High School	36(32,43)	
Senior High School	51(45,94)	
Diploma	2(1,80)	
Undergraduate School	12(10,81)	
Postgraduate School	2(1,80)	
Protein Intake		
Adequate	63(56,76)	
Not Adequate	48(43,24)	
Parity		
1	49 (44,14)	
2	36 (32,43)	
3	16 (14,41)	
4	6 (5,40)	
>4	4 (3,60)	
Miscarriage History		
0	99 (89,19)	
1	12 (10,81)	
Animal Protein Intake (Control)		
Daily	56 (75,68)	
Weekly	8 (10,81)	
Monthly	10 (13,51)	

Characteristic	n (%)	x̄± SD
Animal Protein Intake (Case)		
Daily	2 (5,41)	
Weekly	3 (8,11)	
Monthly	10 (27,03)	
Never	22 (59,46)	

x̄ ± SD = average ± deviation standart, n= sum,% = procentage

About 63 respondents (56.76%) had adequate protein intake and 48 respondents (43.24%) had not adequate. About 56 respondents (75.68%) in the control group consumed high animal protein content (meat, egg, fish, etc) on a daily basis, 8 respondents (10.81%) on a weekly basis, and 10 respondents (13.51%) on a monthly basis during pregnancy. While in the case group there were 2 respondents (5.41%) who consumed high animal protein content on a daily basis, 3 respondents (8.11%) on weekly basis, 10 respondents (27.03%) on mothly basis, and 22 respondents (59.46%) never consumed during pregnancy.

About 49 respondents (44.14%) had their first pregnancy, 36 respondents (32.43%) were second, 16 respondents (14.41%) were third, 6 respondents (5.40%) were fourth, and 4 respondents (3.60%) had more than four times. About 99 respondents (89.19%) have not miscarriage history and 12 respondents (10.81%) had a miscarriage once on their entire pregnancy. There were no respondents who gave birth less months or prematurely.

Based on Chi-square test analysis, it was found that there was a significant correlation between protein intake of anemic pregnant women and LBW incidence indicated by p value (0,000), there was a significant correlation between parity and LBW incidence indicated by p value (0,000), and there was a significant correlation between the miscarriage history and low birth weight incidence indicated by p value (0,000), shown in Table 2 below:

Table 2. Chi-Square Test Correlation Protein Intake, Parity, and Miscarriage History with LBW Incidence in Sukoharjo Regency, Indonesia

Correlation between Variable	Coefficient	P	CI (95%)
Protein Intake with LBW	95,956	0,000	0,016 up to 0,138
Parity with LBW	82,708	0,000	0,049 up to 0,203
Miscarriage History with LBW	31,308	0,000	0,230 up to 0,454

Protein intake of anemic pregnant women and LBW incidence had an odd ratios value of 0,063, which means that anemic pregnant women who consumed less protein intake than Indonesian food consumptions tan dart were risk of 0,063 times greater to giving birth of LBW baby. Parity and LBW incidence have an odd ratios value of 0,119, which means that anemic pregnant women who have greater parity are risk of 0,119 times greater to giving birth LBW baby. Miscarriage history of anemic pregnant women and low birth weight incidence has an odd ratio value of 0,339, which means that anemic pregnant women who have a miscarriage history in a previous pregnancy are risk of 0,339 times greater to giving birth LBW baby, that shown in Table 3 below:

Table 3. Odd Ratio Correlation Protein Intake, Parity, and Miscarriage History with LBW Incidence in Sukoharjo Regency, Indonesia

Correlation between Variable	P	CI (95%)
Protein Intake with LBW	0,063	0,025 up to 0,164
Parity with LBW	0,119	0,062 up to 0,229
Miscarriage History with LBW	0,339	0,248 up to 0,465

Discussion

Between protein intake of anemic pregnant women with LBW incidence has a significant correlation, which means that the greater protein intake affects the baby's birth weight positively. Protein is needed by mothers to fulfill most needs in fetal formation and growth. Protein is the most needed source by the fetus, at 42%, with details of the need for 17% for uterine weight, 14% blood, 10% placenta, and other tissues at 8%[12].

Protein is the one of nutrition that most important for pregnant women during their pregnancy, because protein contributes an important role in fetal growth, placental development, amniotic fluid production, increasing maternal blood volume, and increasing maternal tissue tissueweight. Protein requirements for pregnant women will increase with increasing gestational age. Lack of protein intake is proven to cause LBW[13].

Protein and amino acid components are very useful for improving the nutritional status of pregnant women, especially when mothers enter gestational age in Trimester III, because at that time the fetus experiences growth very quickly so it requires macro nutrient intake, such as protein and energy to increase the value positive fetal growth, and will make the baby born with good physical condition[14]. Protein intake is very helpful in

absorbing iron, because proteins cooperate with protein chains to transport electrons which play a role in energy metabolism[15]. Someone needs to increase iron intake or foods that can help absorb iron to avoid or cure anaemia[16].

Based on the results of interviews with respondents through the FFQ-SQ form, it was found that 22 out of 37 respondents in case group rarely or never consuming foods containing animal protein during their pregnancy. While those who routinely consume foods containing animal protein on a daily basis, 56 of the 74 respondents in the control group. Pregnant women who lack the intake of animal protein (such as meat, milk and eggs), folic acid, and iron are at greater risk of giving birth LBW baby[17].

Dhises consumption contain animal protein are correlate to LBW incidence. This is due to the lack of iron which is abundant in animal protein, such as meat and fish, even though iron is very important for the health of pregnant women and fetal growth in the womb. Consumption of foods that do not have a variety of nutrients in one dish will cause an imbalance in the nutritional intake of pregnant women and fetuses[18].

Factors that cause anaemia is low iron intake[16]. Iron deficiency anemia in pregnant women can affect fetal/infant growth during pregnancy and afterwards[19]. Pregnant women with hemoglobin less than 11 gm/dL were significantly associated with the LBW[20]. The number of low birth weight babies (64%) was statistically significantly higher ($p < 0.001$) in the anemia group than the non-anemia group (10%)[21]. Anemic pregnant women have a higher risk of giving birth to LBW babies than non-anemic, which is 1,25 times[22]. Anemia during pregnancy has 1,51 times higher risk of giving birth to a LBW baby with $P < 0.01$[23].

Between parity and LBW incidence have significant correlation. Where one of the factors that can cause LBW is parity [24]. High parity is when a woman giving birth fourth or more times, that can increase the risk of LBW in a future pregnancy. High parity can cause a serious health problems in both mothers and baby. Closer distance frequency on pregnancy, also can cause uterus more elastic, because uterus does not contract completely so that it causes bleeding after giving birth and giving birth to a LBW baby[25]. Astriana (2017)'s research found that there was a significant correlation between parity and anemia in pregnant women with p value (0.023)[26].

Between miscarriage history of anemic pregnant women and LBW incidence there is a significant correlation. Impaired fetal growth until the case of fetal death in the last pregnancy is related to the incidence of abortion or a miscarriage history in previous pregnancies experienced by pregnant women. In addition, a miscarriage history in a previous pregnancy also increases the occurrence of preterm birth and LBW[10]. Woman who have never experienced abortion or miscarriage have a lower risk of giving birth to LBW babies compared to woman who have an abortion or miscarriage on their previous pregnancies[27]. Wardiyah (2017)'s reasearch found a significant relationship between miscarriage history and anaemia incidence in pregnant women with p value (0,000)[28].

Conclusion

There was a significant correlation between protein intake, parity, and miscarriage history of anemic pregnant women with LBW incidence in Sukoharjo Regency Indonesia. An important suggestion for pregnant women and families, especially in Sukoharjo Regency, is to havea good diet of protein during pregnancy, especially animal protein, to prevent anemia and giving birth LBW baby. In addition, it is also important to plan and maintain the pregnancy, so distance of pregnancy isn't close and also can't cause miscarriage incidence during pregnancy.

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Conflict of Interest: There is no conflict of interest in this study.

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Changes in Community Behavior and Keeping the Quality of Drinking Water Based Ranas Models

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Abstract

Water treatment is an effort to improve the quality of drinking water. The use of Moringa Oliefera can be the first choice besides being safer and easier to obtain in the surrounding environment. However, to improve the ability of water treatment the community needs to consider various factors that influence behaviour change. Empowerment as an intervention concept used by researchers to bring up new behaviours in the management of drinking water treatment. This study aims to explain the model of water treatment to improve the quality of drinking water.

Empowerment will influence various factors that will change people's behaviour. RANAS (risk, attitudes, norms, abilities, and self-regulation) is a formation to create new behaviour based on five blocks related to sanitation and water management. RANAS is based on the psychological theory of health, which postulates that for the formation of new habitual behaviour, five blocks of new behavioural factors include: risk factors, attitudes, normative factors, ability factors, and self-regulation. One of the improvements in water quality can be done by giving Moringa Olivera. New behavioural improvements in water and sanitation management are expected to reduce diarrheal disease in the community.

Keywords: *Water treatment, empowerment, Nursing, RANAS, community.*

Introduction

Pudak Kulon village is one of the villages in Pudak Subdistrict, Ponorogo Regency which is in the highlands and has abundant water resources and good quality[1]. Including Desa Bekring, the area around the highlands that has a fairly good quality water source. Student observations of the 2008 Ners Professional practice show that: 1) the majority of public drinking water comes from natural springs; 2) storage and processing of water for consumption is not fully in accordance with the standard of health; 3) Bekiring Village has not fully implemented Open Defecation Facilities (ODF); 4) the behaviour of the people has not been able to maintain the sanitation of river flows that originate from natural springs[2]. Various risks of health problems can arise, one of which is diarrhoea. The source of drinking water, the distance of the spring to the nearest faeces shelter, the use of defecation facilities, and the type of toilet affect the number of diarrhoea events[3]. Improving the quality of drinking water is one of the main focuses in many countries in the world[3]. The empowerment method is developing a successful intervention strategy for promoting behaviors related to health and water sanitation. However, until now the right method of empowerment is unclear.

Water sources of Indonesian people use protected dug wells (29.2%), pumping wells (24.1%), and tap water (19.7%) that are used to cover all household needs, including drinking. Based on the residence of the people who live in urban areas, they use drill/pump wells (32.9%) and tap water (28.6%), while in rural areas more use of dug wells are protected (32.7%). The use of water per person per day in Indonesia averages 50 - 99.9% litres (28.3%) and between 100-3000 litres (40%) for overall needs. While 273 million Indonesian people consume 8 glasses per day, equivalent to 2 litres of mineral water for drinking. Meeting the needs of mineral water consumption comes from wells[4]. Drinking water

sanitation that is not properly maintained can cause the risk of diarrheal disease. Diarrhoea sufferers in East Java from year to year show more than 500,000 sufferers.

The 9th SDGs: Maintain biodiversity and ensure good management of water, oceans, forests and natural resources. Maintaining the preservation of water resources as stated in the Declaration by the United Nations (UN) that water is a human right; that is to say, every human being on this earth has the same basic rights to water use. In Indonesia, community rights to water use are guaranteed through the 194 Constitution of the Republic of Indonesia, and Law No. 7 of 2004 concerning Water Resources.

The method of community empowerment is an effort to improve people's behaviour, we believe that we can help minimize water pollution to maintain and preserve the quality of water resources. Maintenance of water quality is important to maintain human survival and the preservation of living things in the world. Through the method of community empowerment, it will be able to increase the attention and innovation of the management of quality drinking water.

Method

Writing this scientific paper uses the literature review method. Searches are made, among others, on national journal articles and international journals. National Journal articles come from three main website addresses, namely: a) Journalumpo.co.id; b) google scholar, and c) neliti.com published from 2008 to 2018. The keywords used in this literature review are mineral water, quality, water requirements. In order to strengthen the theory review written, international journals sourced from PUBMED with "RANAS approach" and "quality water Indonesian" keywords.

Concept:

1. RANAS Model:

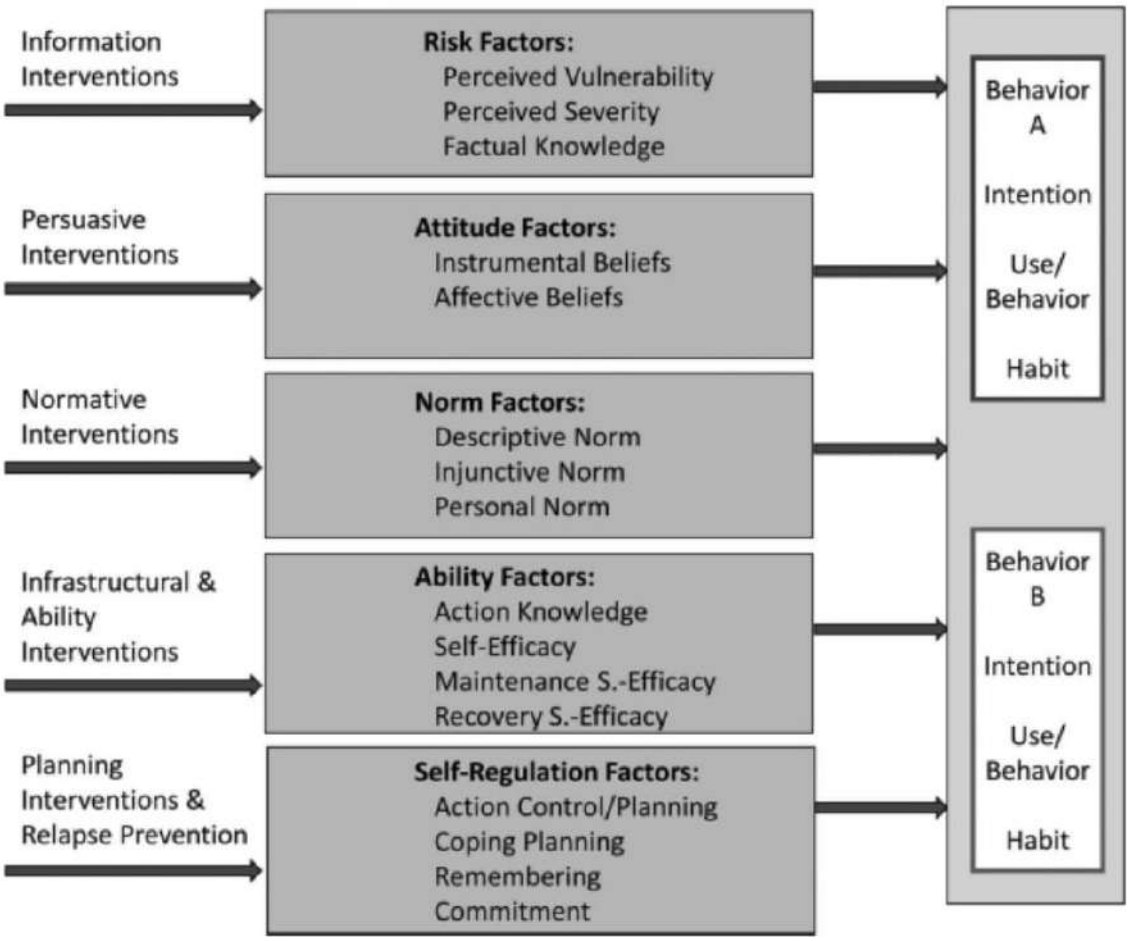

Figure 1. RANAS model of behaviour change (Mosler, 2012)

RANAS model is a formation for generating new behaviours based on five blocks related to sanitation and water management[5]. The RANAS component models are risk, attitudes, norms, abilities, and self-regulation) The proposed model is divided into four different components: (1) block factors, (2) behavioural factors, (3) target behaviour, and (4) behaviour change interventions in accordance with factor blocks (figure 1).

A. Risk Factor: RANAS Model influences behaviour in water management based on the block of risk perception factors through intervention in the form of providing information. The right time to provide information (when given with information), when the person has formed an understanding of health threats. Risk perception can be influenced by personalized risk messages, which focus on the effects of cumulative risk, and by presenting qualitative and quantitative examples[6]. Risk perceptions can also be changed by displaying risk information based on scenarios[6]. Community knowledge can be improved by presenting information about the circumstances and the possibility of contracting the disease[6].

B. Attitudes Factor: Belief can be changed with persuasive interventions, strong arguments or peripheral instructions (around) as explained in the Elaboration Likelihood Model[7]. A persuasive argument is an argument that uses causal explanations; explain functionality; present novels and important information; and high positive expectation values. Instructions for convincing peripherals are competence, sympathy, credibility, well-known, source publicity, and length and number of message arguments[7]. Affective beliefs (feelings) can also be changed through persuasive interventions, but this requires effective persuasion - presenting healthy behavioural performance as happy, or attaching reluctance (eg disgust) to unhealthy behaviour[7].

C. Norm Factor: Normative messages in the form of correct commands about behaviour that are not approved are effective[8]. This unfortunate behaviour can often be less effective because it emphasizes descriptive norms by stating what most people do. Conversely, descriptive norms can be changed by highlighting behavioural norms that are still rare but desirable, or by reducing 'social pressure' to engage in unfavourable behaviour by referring to beneficial injunctive norms[8]. Descriptive norms can be changed by public commitment by showing that there are people who carry out new behaviours. Regret, individuals are encouraged to imagine how they will feel after they behave in ways that are not consistent with their personal norms, can be reinforced by desirable behaviour[5].

D. Ability Factor: The ability to help individuals gain confidence in their ability to perform a behaviour. Resources in the form of finance or support in the form of goods can be given directly to individuals or combined to the requirement that individuals must try to access resources. In addition, help from neighbors, friends, acquaintances, or relatives can support people with material assistance, knowledge of actions, or social[9]. Modeling (seeing someone doing behavior) and strengthening (seeing someone who is valued for behavior) promotes the desired behaviour; individuals become aware of their own competencies and compare their achievements to others[9]. Knowledge of action (certain skills) is enhanced by the transfer of knowledge (education). Self-efficacy can be enhanced by guided training, demonstration of skills, instruction, and feedback[10]. Maintenance (coping) of self-efficacy can be improved by identifying barriers and planning solutions forbehaviour change barriers[11]. Overcoming recurrence will improve recovery self-efficacy. Individuals can overcome it by relapse by identifying risky situations where they may fall back to old behaviors, plan coping responses, and practice these responses until they become automatic[11].

E. Self Regulation: Self-regulation is the ability of a person to change his behaviour [18]. Self-regulation arises when someone motivates and guides their actions proactively according to their expectations. Planning interventions help individuals translate goals into preventive actions, avoids bad habits that inhibit failure[6]. The ability to prevent recurrence can be improved by health education[11]. Individuals can avoid goals that are contrary to considering possible obstacles[11].

A Relevant Concept:

A. Understanding of Water: Water in Biology and Chemistry (H2O Compounds)-water is a chemical compound that is the result of a bond of element hydrogen (H2) which is compounded with an element of oxygen (O) in this case forming H2O compounds. Drinking water is water whose quality meets health requirements and can be drunk directly[12].

While quality drinking water is the following incision 1) Physical requirements, clear temperature (colourless), tasteless, below the temperature of the water outside; 2) Bacteriological requirements, must be free of all bacteria, especially pathogenic bacteria. The way to drink water is contaminated by pathogenic bacteria, by examining water samples. And if there are less than 4 checks, Escherichia coli bacteria, the water there meets health requirements; 3) Chemical requirements, lack or excess of one chemical in water, will cause physiological disturbances in humans.

Escherichia coli bacteria is an indicator of water pollution which can cause diseases of the digestive tract causing diarrhoea. Therefore quality mineral water is found from healthy wells that have the following conditions: 1. Location conditions or distance (note the distance of wells and latrines, wastewater excavation holes and other sources of excrement).

Government Regulation No.82 of 2001 concerning water quality which includes physical, chemical and biological quality standards, namely: (1) Physical Quality, in determining the physical quality of water seen from general parameters which include colour, smell, taste, and turbidity. The smell and taste are usually caused by certain chemicals and bacteria. That "Smell and taste can be produced by the presence of microorganisms in water such as algae and by the presence of gases such as H_2S which are formed under anaerobic conditions and by the presence of certain organic compounds"[19]. (2) Chemical quality, chemical water quality including pH value, chemical compound content in water, residual or residual content, for example, pesticide residues, detergents, toxin or toxic substances, and chemical reactions, which can negatively affect health and other activities related to the use of water. (3) Biological Quality, biological quality is usually most widely used to determine water quality through its microbiological parameters. For example, the presence of microbes, especially coli bacteria.

Discussion

Most of the dug wells and half of the refill bottled water in slums in Indonesia are contaminated with faeces. Faecal contamination is caused by dug wells and springs because the majority of households do not use *septic tanks* and dispose of human waste directly into the river[13]**.** Similar conditions also occur in the community of Bekiring Ponorogo Village. So that the quality of drinking water has decreased.

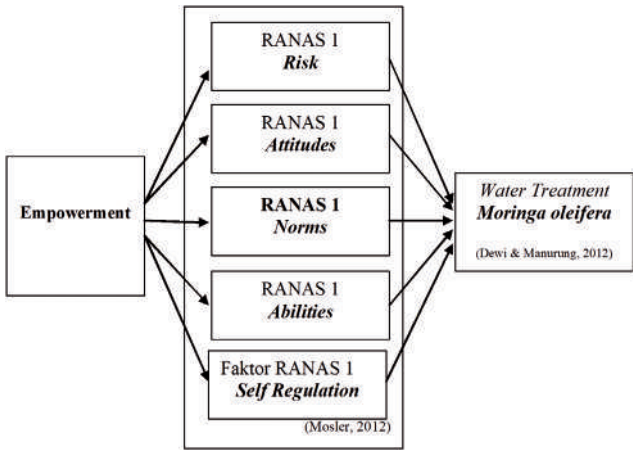

Figure 2. Treatment water model with RANAS-based MODEL

Empowerment as a way of changing people's behaviour preserve and maintain the water quality min um for the continuity and sustainability of life in the neighbourhood specific Retained Earnings illustrated in Figure 2.

Empowerment will affect various factors that will change people's behaviour. RANAS (*risk, attitudes, norms, abilities, and self-regulation*) is a formation for generating new behaviours based on five blocks related to sanitation and water management. RANAS is compiled based on psychological health theory, which postulates that for the formation of new habitual behavior, five blocks of new behavioral factors including : risk factors (*risk*), attitudinal factors (*attitudes*), normative factors (*Norm*), factor of capacity *(ability),* and the factor of self-regulation *(self-regulation)*[6]. One of the improvements in water quality can be done by giving *Moringa Olivera*[14] . New behavioural improvements in water and sanitation management are expected to reduce diarrheal disease in the community.

Empowerment in the *water treatment* model is mediated by *risk* factors*, attitudes, norms, abilities, and self-regulation*. The *water treatment* model initiated by researchers is similar to research[5]. Impact of the campaign on water treatment mediated through differences in health knowledge *(risk),* changes in the norm, and self-efficacy beliefs *(self-regulation).* The findings of this study indicate that water treatment behavior can be successfully promoted using health psychology theory. However, this research provides opportunities for improvement in the design and implementation of campaigns. therefore empowerment is expected to improve the weaknesses of this research.

Treatment water besides using *Moringa oliefera* can be done using the chlorination method and with the *boiling* method. *Moringa oliefera* is the first choice because it comes from natural ingredients and is easier to *obtain*. The results showed that the use of Air RahMad (chlorination) had a lower E Coli content and the incidence of diarrhoea was less frequent than people who used the boiling method[15]. The *Back to Nature* slogan will increase the use of natural ingredients (*Moringa oliefera*) compared to chemicals (chlorination). However, the use of automatic chlorination technology in the future will improve the quality of drinking water[16].

Research on improving drinking water quality by considering knowledge factors, attitudes and behaviours and health risks will improve management of drinking water management in the future[17]. One of the basic human needs for future research. In addition, behavioural research in managing the quality of drinking water is still very rare.

Conclusion and Recommendations

Cleanliness of drinking water that does not conform to standards will threaten health. The community empowerment approach will facilitate health workers with the community and related sectors to change the behaviour of improving the quality of drinking water.

Nurses need to apply the appropriate method of empowerment approach to the Bering Ponorogo village community to improve the drinking water storage and management behaviour so that the risk of diarrheal disease can be minimized.

Conflict of Interest Statement: The authors declare that there is no conflict of interest.

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Ethical Clearance: The study was given ethical approval from health research ethics committee Faculty of Health Sciences Universitas Muhammadiyah Ponorogo number 101-KEPK.

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Breast Cancer and Hormonal Level Changes

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Abstract

Purpose: Study of Surgical procedure used in treating Breast Cancers–Mastectomy, Bilateral Mastectomy and Adjuvant procedures and the rise in the blood hormonal levels of the breast cancer patients. The purpose of the study is to understand breast cancer and to delve into various factors that increase the risk of contracting breast cancer. It describes various surgical procedures like mastectomy, bilateral mastectomy and adjuvant procedures. It also describes the various serums that body secretes that can cause cancer. It sees the genetic factors and other risk factors that can cause cancer.

Method: It studied 30 breast cancer cases from private Clinicat Babylon. Only those patients who had undergone mastectomy or had tumors removed from breast were considered. These patients were in the age group of 25 to 65. Statistical data was arrived at by questionnaires and interviews with surgeons, nurses and patients. The paper also describes changes in the blood hormones of cancer patients. Complete blood tests were done on 30 patients that included the measurement of various serum and blood plasma cells such as Estrogen hormone, Progesterone hormone (Prog. H), Serum total cholesterol, Serum triglyceride, Serum HDL-cholesterol, the concentration of LDL cholesterol and other proteins in serum as IgG, IgM, and IgA.

Interpretations: Cancer if detected at a young age need not lead to mastectomy, but surgically removing tumors will suffice. As the age progresses the incidence of mastectomy and bilateral mastectomy also increases. The blood hormones of cancer patients showed abnormal readings and a conclusion can be drawn that BC can be detected from the abnormal levels of blood hormones.

Keywords: *Blood hormones, breast cancer, tumors.*

Introduction

According to Cancer.Net (2019)[2 & 3] Breast Cancer kills around 42000 women and at least 500 men every year. The number of women who are diagnosed for invasive breast cancer is approximately 268,600 in United States alone and 62000 women have in situ breast cancer. Though there have been many innovations in the medical science, women and to a lesser degree men continue to die or suffer because of this cancer.

According to Holst□Hansson, Idvall, Bolmsjö & Wennick, (2018)[12] say that cancer is gaining attention in Iraq as a significant health problem, this is because there is an increase in the cases of incidence as well mortality. Iraqi Cancer Board also echoes the same concerns. The reasons for the increase in cancer cases is attributed to many factors like improvement of case detection, early detection programs, rising awareness amongst the population and better registration of cases.

Fisher et al (2014)[9] opine that breast cancer (BC) is kind of malignancy that appears in the tissues of the breast. It occurs in both pre-menopausal and post-menopausal women. BC forms in those tissues of the breast that usually carry milk and milk producing glands called lobules. Females with a history of breast cancer are at a risk having breast cancer too. Fisher et al (2014)[9]

Malvia, Bagadi, Dubey & Saxena (2017)[8] opine that breast cancer (BC) starts with a development of tumor in the breast. There are 2 types' tumors benign and malignant.

Malignant tumors are aggressive and cancerous. In case malignancy is suspected the doctor will perform biopsy to understand the aggressiveness and severity of tumor. Coles et al (2017)[13]

Metastatic cancer happens when the cancerous cells of the malignant tumor spread to the other parts of the body via lymph system to form secondary tumors.

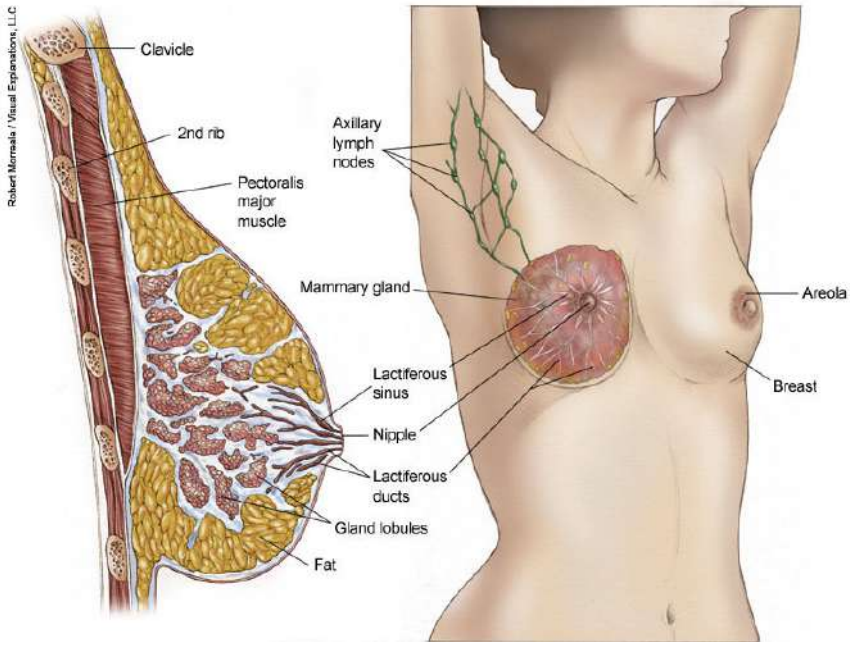

Fig. 1: American Society of Clinical Oncology.

Anampa, Makower & Sparano (2015)[12] say that there is only one cure for advanced breast that is mastectomy, if cancer is detected earlier then only the tumor can be removed with some healthy tissue surrounding it called margin.

Cancer Detection: Hosseini, et al (2016)[13] says that detection of cancer is very difficult as normal hormones and chemicals that are useful to the healthy body go on to fuel cancer cells also. Some of them are listed below.

Estrogen: Estrogen which is essential for growth and normal development of breast and its tissues is known to cause cancer if there is a higher exposure of the hormone. 2 types of cancers can be formed when there is a high exposure to estrogen as genotoxin and mitogen. Samavat, & Kurzer, (2015)[11]

Lipids: It is believed that the changes in the lipid profile also causes cancer. Lipids have an important role in the maintenance of the cell integrity. It is hypothesized that when there are changes in the lipoprotein levels and plasma lipid there is malignant proliferation in the tissues of the breast. It has been further postulated that because of concentration in serum lipid in cancer patients can bring about increase production of tumor necrosis factor. Garg, et al (2016)[11]

HER_2:

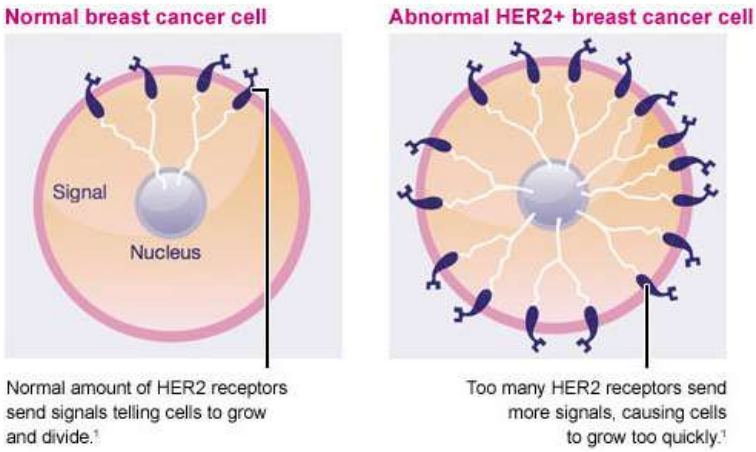

Fig 2. HER_2 (Source Cancer Research UK)

In fig 2. Shown HER_2/neu gene is a growth hormone. Healthy HER_2 receptors are proteins which are put in use when the breast cell grows, divides and in repairs. It was observed that in at least 25% of breast cancer patients this gene is not functioning properly. It makes excessive copies of itself in a process known as "HER_2 gene amplification." These extra cells then make the cells to make many HER_2 receptors. This is called "HER_2 protein over expression." It is because of these processes that breast cells divide and grow in an uncontrollable fashion. Katayama et al (2019)[14]

The Lymph System:

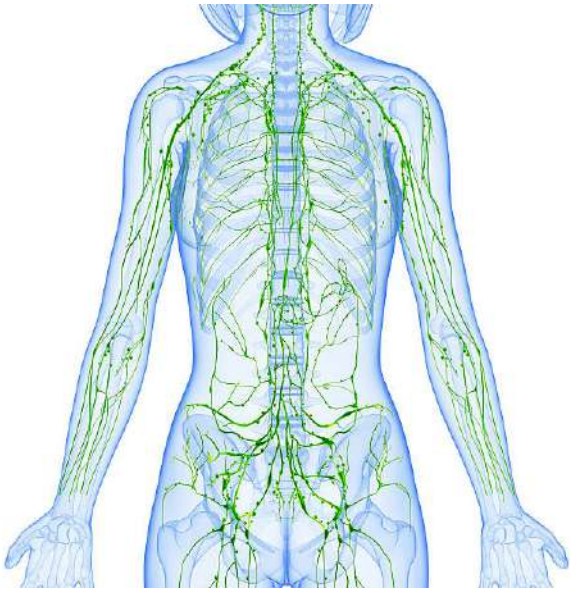

Fig 3. The Lymph Systems
(Source cancer research UK.)

The network of lymph (fig. 3) nodes and lymph vessels run throughout the body and are part of the immune system. Just as the circulatory system of blood which distributes elements across the body. This system transports fluids and disease fighting cells.

Cancer cells typically grown in the ducts, lobules and the lobes within the lymph network. Katayama et al (2019)[14]

Genetic Factors: Lahart, Metsios, Nevill, & Carmichael, (2015)[15] say that the following genetic factors are associated with BC

- **Gender:** *Female*
- **Age:** 55.
- **Race:** Caucasian women are more vulnerable to BC than any other race.
- **Family History and Genetic Factors:** If there has been a case of cancer (either breast or ovarian) in the immediate family such mother, sister then the chances of having cancer increase. If the relative had cancer before 50 then the risk increases.
- **Personal Health History:** If the patient has been diagnosed with BC in one breast, then the chances of having BC in the other breast increases in the future. The risk also increases if abnormal breast cells have been found before (such as lobular carcinoma in situ (LCIS), atypical hyperplasia, or ductal carcinoma in situ (DCIS)).
- **Menstrual and Reproductive History:** Late menopause (after 55), Early menstruation (before age 12) having the first child at an older age, or if a women has never been pregnant also increases the risk for breast cancer.
- **Certain Genome Changes:** Mutations in some genes, like BRCA1 and BRCA2, can increase the risk of breast cancer. This is determined through a genetic test, which patients can consider taking if they have a family history of BC. Those who have these mutations may pass them to their children.
- **Dense Breast Tissue:** Dense breast tissue also increases risk for BC. It also makes the lumps harder to detect.
- Radiation therapy on the chest: If the woman has been given radiation therapy to the chest before the age of 30 then there is risk of contracting BC.
- Combined Hormone Replacement Therapy (HRT): Having combined hormone replacement therapy, as prescribed for menopause, increases the risk for BC and It also increases the risk that the cancer will be difficult to detect in the earlier stages.

Cancer Treatment: Rheinbay et al (2017)[9] opines in case there is BC is found then the surgery is the only effective treatment. In case the cancer is detected in early stages then lumpectomy is done where only the tumour is removed and the rest of the breast is conserved.

Decision to perform mastectomy (removal of the breast) or lumpectomy (removal of the tumour) is done with through consultation and permission of the patient.

Nowadays there are better method to perform mastectomy which preserve the breast skin and allows for a natural breast appearance following the surgery.

When do doctors advise mastectomy?:

- In case of multiple tumours in the breast
- There are widespread or malignant-appearing micro calcifications (calcium deposits) that have been identified as cancerous after biopsy.
- In case of recurrence of breast cancer after radiation therapy
- Even after undergoing lumpectomy; cancer is found on the edges of the operated area.
- The size of the tumour is large compared to the size of the breast
- In case of pregnancy where radiation will harm the fetus. Coles et al (2017)[13]

Material and Method

A cross-sectional of 30 female breast cancer patients both young and old from hospitals and daily clinics in Babylon province were studied. They were presented with questionnaires and the physicians and nurses were interviewed. Their ages varied from 25 to 65 as shown in the table and pie chart below.

Table 1 and pie chart about age of patients

Age	No. of Patients
25-35	1
36-45	5
46-55	11
56-65	13
Gender	All Females

Surgeries and Adjuvant procedures performed on the study group

Table 2.

Age	Mastectomy of single breast	Bilateral Mastectomy	Removal of tumor	Chemotherapy	Radiation Therapy
25- 35	0	0	1	1	0
36-45	4	0	1	1	1
46-55	7	3	1	11	11
56-65	8	5	0	13	13

Discussion on Surgical Procedures

The female aged 25-35 had tumour which was surgically removed, biopsy showed it was malignant in nature and so chemotherapy was prescribed to her. Hosseini et al (2016)[13]

Tumour also removed from 1 patient in the age group 36-45, but radiation was used before surgery to reduce the size of the tumour. Holst□Hansson Idvall, Bolmsjö, & Wennick, (2018) [12]

Tumour was also removed from the age group 46-55. All the patients had to undergo adjuvant procedures to prevent the disease from appearing again. Holst□ Hansson Idvall, Bolmsjö, & Wennick, (2018) [12]

19 females had to undergo single mastectomy and also adjuvant therapy and 8 patients had to undergo bilateral mastectomy and adjuvant procedures to arrest the spread and re-occurrence of the disease.

Study of the blood samples for serum/hormonal imbalance

Blood contains different types of cells in definite proportions in normal human beings, however in case of diseases or infections these proportions change dramatically. The same holds true for cancer patients also. Therefore the hematological and bio-chemical parameters of these 30 women were also studied.

Findings:

Table 3 shows the results of hematological parameters received from 30 BC patients

Test	Patient
ESR mm/hr	17.355 ±6.154*
WBC X103/μL	4.509 ±0.8839*
RBC x106/μL	4.372 ±0.7995*
Packed cell volume (%)	35.206 ±4.105*
Platelets X103/μL	180.27 ±32.158*
Lymphocytes (%)	46.009 ±4.7399*

*Values expressed as Mean +/-SD P value <0.05 was considered as significant.

The mean red blood cell count, packed cell volume, platelets count, white blood cell count, and lymphocytes are lower than what is observed in healthy women. Whereas the mean ESR values of the breast cancer patients were considerably higher than normal healthy women.

Table 4: Biochemical parameters of 30 female BC patients

Test	Patients
Est. H (Pg/ml)	92.286±20.407
Prog. H. (ng/ml)	2.347±0.850
Cholesterol(mg/dl)	182.14±16.868
Triglyceride(mg/dl)	120.77±10.152
H.D.L. (mg/dL)	55.148±20.486
L.D.L. (mg/dl)	74.605±13.050
IgA (g/L)	3.550±0.411
IgM (g/L)	1.685±0.351
IgG (g/L)	18.478±1.834

*Values expressed as Mean +/-SD P value <0.05 was considered as significant.

Table 3 shows the biochemical profile (Mean ±SD) in women with breast cancer. The data indicated higher levels of estrogen and progesterone than normal healthy women. Also total cholesterol, triglycerides level HDL were at higher than normal healthy levels. LDL levels were lower than those found in healthy women. Immunoglobulin's IgG, IgA and IgM were also at higher than normal levels.

Discussion on blood tests: Physicians routinely use complete blood picture in diagnosing various diseases and infections like anemia, hemorrhagic states, cancers, allergic disorders and immunity disorders. Lahart, Metsios Nevill, & Carmichael (2015)[15] In this study the low hematocrit levels show that cancer patients are suffer from anemia. This observation is in sync with other studies of similar nature.

With regards to age BC patients above the age 40 have significant reduction in RBC count and hematocrit level than healthy individuals of the same age. Medicinal Chemistry[12] opine that this could be because these parameters tend to reduce after the 5th decade or it could be that because of cancer also causes immune suppression and bone marrow suppression. It is also found that BC tends to be more aggressive in the younger patients. The low blood counts can also be attributed to side effect of chemotherapies that patients had to undergo as post-operative procedure. Chemotherapy also reduces the lymphocyte and it is considered as an adverse effect of this procedure Anampa, Makower, & Sparano (2015)[12]

There is a significant increase serum estrogen in patients of breast cancer women than normal healthy women. These results are also in sync to those obtained by other investigators.

According to Rheinbay et al (2017)[9] It can be concluded that increased estrogen levels is a good marker in for increasing the risk factor of BC. Estrogen levels play an important role in the development of BC.

The results of table 3 show that there is noticeable increase in progesterone hormone in BC women compared to healthy women. Other investigators have also reported the same results. It is believed that increase in ovarian secretion of progesterone hormone could lead to BC. There is a marked increase in serum cholesterol in BC women than normal levels. However this may be because there is positive correlation between increased cholesterol levels and menopausal status. Rheinbay et al (2017)[9] There is an increase in serum Triglyceride in the BC patients, but this could be attributed to the intake of tamoxifen, which is prescribed for patients having BC Rheinbay et al (2017)[9]

Finally it was observed that there were marked differences in BC women and healthy women in serum immunoglobulin IgA, IgG. However the results also showed that there was marked difference in serum immunoglobulin IgM. Some investigations have reported that the advancing metastatic BC is associated with high serum immunoglobulin levels of IgG and IgA, other investigators believe that a defense reaction against increasing tumor load or the secretion of immunoglobulin by the tumor Garg, et al (2016)[11]

Conclusion

This study shows that all these women had contracted with breast cancer which was in different stages. All had undergone surgery as described above and also adjuvant procedures to arrest the spread of the disease.

Further blood samples were taken from the study group it was found that anemia; thrombocytopenia and leucopenia were usual basic features to be found in breast cancer patients.

This study also measured various biochemical factors like cholesterol, level of estrogen, progesterone

hormones, lipoproteins (HDL, LDL), triglycerides and some immunoglobulin's (IgG, IgA and IgM). The results show that there was a huge increase in cholesterol, level of estrogen, progesterone hormones, lipoproteins (HDL, LDL), triglycerides and high levels were also recorded in immunoglobulin's (IgG, IgA and IgM).

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Socio-demographic Characteristics and Caregiver's Quality of Life Associated with Suspected Developmental Delay among Early Childhood in Northeast of Thailand

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Abstract

The first 5 years was possibly the most critical and extremely important in child development. Development problem of Thai children are not improve to standard.

This research aimed to analyze about association between Socio-demographic Characteristics, Caregiver's quality of life and suspected developmental delay among early childhood. A Cross-sectional analytical study, there are 1,168 sampling groups; caregivers 584 persons, early childhood 584 persons, between April to May 2019. The multivariable analysis was used by multiple logistic regression.

Early childhood aged average 36.1 months, males are 53.1%, and with suspected developmental delay 48.1% . There are 4 factors which are associated with the suspected developmental delay; 1) monthly self-income of caregiver (AOR = 1.9; 95% CI: 1.24 to 2.87; p = 0.003) 2) gander (AOR = 1.9; 95% CI: 1.33 to 2.64; p<0.001) 3) age range (AOR = 2.5; 95% CI: 1.54 to 4.09; p<0.001) and 4) quality of life about social relationship (AOR = 1.6; 95% CI: 1.23 to 2.01; p = 0.020).

Prevalence of suspected developmental delay is quite high, Socio-demographic Characteristics and caregiver's quality of life has influenced to the early childhood development.

Keywords*: Early childhood, Developmental, Quality of life.*

Introduction

Children are important resource in society; therefore, the children should have efficient development so that they can grow up to be good children learn qualities that will help them become happy, and be able to create and do anything benefit to our society in the future. The children are significant to our county which we should invest them to get high number of returns around 6.7-17.6 times[1].

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In the first five years of life, it's the most important time at any other time in their lives; their developments will go faster including their brain develop more and faster around 80% comparing to adults. Besides, it's also related to the foundation for children developments and their quality of life. Window of opportunity points us that if we evaluate or notice their delayed development in early before age of 6 years, that can stimulate their development and help them to be their normal developments[2].

A report from World Health Organization found out that the children all around the world 15-20%, their development are not appropriate[3]. In addition, department of health, ministry of public health 2017 has observed that children normal developments for

early children in Thailand are in their rate at 70%, the children in Northeast of Thailand is at only 50-60% [4]. Regarding to family structure, some parents move out from rural area to city and leave their children to stay with grandparents, this situation has occurred so much in Northeast region, the children do not live with their own parents are 30%[5], so family structure are members of grandparents and grandchildren which without parents.

After literature review, there are risk factors which effect to the children developments involve with biological and economic and social. Regarding to biological risk factor composes of health and mothers' nutrition status, complication during intra partum and postpartum periods including health and nutrition status of the children[6]. Relating to economic and social factors compose of age, occupation of mothers, including family income and the way how they raise the children, especially mothers' education level is quite so much affect to the children than fathers[7,8]. In the past, there are many studies related to risk factors which effects to the early children developments which still be problem. A part of this issue might cause of biological and economical and social risk factors. However, there is not any study about socio-demographic characteristics, caregiver's quality of life and early children developments in Northeast of Thailand.

Therefore, this study aimed to analyze about association between socio-demographic characteristics, caregiver's quality of life and suspected developmental delay among early childhood in Northeast of Thailand.

Material and Method

Study Design and Sampling: A cross-sectional analytical study and collect data from April through May 2019. The sample size was calculated following formula to specify sampling size by multiple logistic regression, Hsieh FY [9]. ρ of 0.70, VIF= 3.33. The sampling size of this study is 584 persons.

Using Multi Stages random sampling did in research for 20 provinces in Northeast region. Simple random sampling is used for 5 provinces at 25% out of all provinces in this region, next, for selected 2 districts out of each sampling province. Then, do random sampling group from name list of the early children (0-6 years) from public health department of sampling district (HosxP PCU program), according to proportional to size for 10 districts, get sampling group 58-60 persons each.

Inclusion criteria are Thai nationality children aged 0-6 years and been live in Northeast of Thailand. The caregivers are look after children at least 6 months up, their profiles can be given us completely and they must have the maternal and child health handbook. Regarding to exclusion criteria are disable children from birth which effect to their developments such as down syndromes, autism, cerebral palsy and children with seizure history, children with no cooperative to check development, children with no any age history and children who are not raised by their own blood relatives.

Material: Socio-demographic Characteristics which compose of age, gender, occupation, education level, self-income, family income, income sufficiency, number of children per family and living with their own parents.

Evaluation of Caregiver's quality of life by WHOQOL-BREF[10]: there are 4 domains; physical, psychological, social relationship and Environmental. Divide quality of life in each domain and overall for 3 levels which are poor, medium and good.

Suspected developmental delay test by Denver II is used to screen children's development. Four domains (gross motor, fine motor adaptive, language and personal-social). It consists of 125 items, testing time is around 10-20 minutes. The testing results are divided into 2 levels; Normal, develop a child without a delayed test and no more than one caution tests. Suspected has a test two or more cautions and one or more than one delay tests. This study uses Denver II in Thai[11] to do developmental tests. In addition, assessor has been passed children development training from the National Institute for Child and Family Mahidol University.

Data Analysis: Relating to analysis of association between socio-demographic characteristics, caregiver's quality of life and suspected developmental delay, a simple logistic regression, was used for bivariate analysis to identify individual factors associated with suspected developmental delay. The factors that had p-value <0.25 were processed into the multivariable analysis using multiple logistic regression by backward elimination method which statistical significance is (p-value= 0.05), reported the adjusted odds ratio (AOR), 95% confidence interval (95% CI) and using Stata version 13.1 program (Stata Corp, College Station, TX)

Result

Socio-demographic Characteristics: The total 1,168 sampling; 584 caregivers and 584 childhood found most of caregivers are female 93.3%, average age is 40.4 years with a range of 16-74, their occupation is agriculturist 44.4%. Education level is primary school 46.4%, average monthly self-income 6,394.8 THB, average monthly family income 15,029.8 THB. Early childhood are males 53.1%; average age is 36.1 months with a range of 9-72 months, the children aged 36-76 months is 46.7%. The child living with their own parents is 51.4%. (Table 1)

Table 1: Socio-demographic characteristic

Factors	Number	(%)
1. Caregiver's age (Years)		
16-29	165	28.2
30-59	359	61.5
60-74	60	10.3
Mean: SD	40.4	13.8
Median (Min: Max)	39.0	16: 74
2. Occupation		
housewife	147	25.2
agriculturist	259	44.4
governmental officer	120	20.5
businessman, trader	58	9.9
3. Education level		
primary school	271	46.4
high school/vocational	213	36.5
bachelor's degree up	100	17.1
4. Monthly self-income (THB)		
< 10,000 (325 US dollars)	455	77.9
> 10,000	129	22.1
Mean: SD	6,394.8	7,922.9
Median (Min: Max)	4,000.0	0: 70,000
5. Monthly family income (THB)		
< 10,000	244	41.8
> 10,000	340	58.2
Mean: SD	15,029.8	15,706.5
Median (Min: Max)	10,000.0	1,000: 200,000
6. Income's sufficiency		
sufficient	299	51.2
insufficient	285	48.8
7. Gender of child		
male	310	53.1
female	274	46.9
8. Age range (months)		
0-12	105	18.0
13-35	206	35.3
36-72	273	46.7
Mean: SD	36.1	15.7
Median (Min: Max)	36	9:72
9. Number of children per family		
1	276	47.3
2	257	44.0
3-5	51	8.7
10. living with parent		
living with parents	300	51.4
not living with parents	284	48.6

Caregivers' quality of life: It found average score of their quality of life in good level 77.7%. When consider in each domain, their psychological domain is in good level 75.7%, next on down environmental domain is 71.7%, social relationship is 68.5% and physical is 66.3%. (Table 2)

Table 2: Caregiver's quality of life

Factors	Number	(%)
Quality of life in overall		
medium	130	22.3
good	454	77.7
Mean: SD	104.9	13.0
Median (Min: Max)	104.0	71: 130
Quality of life in each domain		
Physical		
medium	197	33.7
good	387	66.3
Psychological		
poor	2	0.3
medium	140	24.0
good	442	75.7
Social relationships		
poor	6	1.0
medium	178	30.5
good	400	68.5
Environmental		
poor	1	0.2
medium	164	28.1
good	419	71.7

Children development: The early childhood development in Northeast of Thailand found they are in suspected developmental delay 48.1%. If consider each domain development, language domain tends to be delayed the most 39.4%, next, it's fine motor adaptive 27.2%. (Table 3).

Table 3: Denver II Results

Denver II	Number	%
Normal	303	51.9
Suspect	281	48.1
Gross motor	79	13.5
Language	230	39.4
Fine motor adaptive	159	27.2
Personal-social	74	12.7

Factors associated with suspected developmental delay: Bivariate analysis: Bivariate analysis on the association between each independent variable and suspected developmental delay in early childhood was performed presenting the crude odds ratio (OR) with 95% CI, and p-value. All factors that had p-value <0.25 were proceeded to multivariable analysis by using multiple logistic regression. (Table 4).

Table 4: Factors associated with suspected developmental delay: Bivariate analysis

Factors	Number	% of Event	Crude OR	95%CI	P -value
1. Monthly self-income (THB)					**0.003**
> 10,000	129	36.4	1		
< 10,000	455	48.1	1.8	1.23-2.76	
2. Gender of child					**<0.001**
Female	274	39.8	1		
Male	310	55.5	1.9	1.36-2.62	
3. Age range (months)					**<0.001**
0-12	105	31.4	1		
13-35	206	46.6	1.9	1.16-3.12	
36-72	273	55.7	2.7	1.70-4.41	
4. Living with parent					**0.011**
Living with parents	300	43.0	1		
Not living with parents	284	53.5	1.5	1.10-2.12	
5. Quality of life in physical domain					**0.049**
Good	387	45.2	1		
Medium	197	53.8	1.4	1.00-1.99	
6. Quality of life in social relationship domain					**0.016**
Good	400	44.7	1		
Medium and poor	184	55.4	1.5	1.18-2.18	

Factors associated with suspected developmental delay: Multiple logistic regression: Multiple logistic regression analysis by Backward elimination indicated that The children who are raised by the caregiver who has monthly self-income lesser than 10,000 THB, tend to be suspected developmental delay more than the ones who are taken cared by the caregiver with monthly self-income over than 10,000 THB for 1.9 times. (AOR= 1.9; 95% CI: 1.24 to 2.87). Boys tends to be suspected developmental delay more than girls for 1.9 times (AOR= 1.9; 95% CI: 1.33 to 2.64)

The child aged 13-35 months has a chance to suspected developmental delay more than the ones aged 0-12 months in double fold. (AOR= 2.0; 95% CI: 1.21 to 3.34). In addition to the children aged 36-72 months tends to be suspected developmental delay more than the children aged 0-12 months in 2.5 times (AOR= 2.5; 95% CI: 1.54 to 4.09).

The children who are raised by the caregiver with social relationship in medium and poor level, it has chance to reflect the children be suspected developmental delay more than the ones who are in good level for 1.6 times. (AOR= 1.6; 95% CI: 1.23 to 2.01). (Table 5).

Table 5: Factors associated with suspected developmental delay: Multivariate analysis

Factors	Number	% of event	Crude OR	Adjusted OR	95% CI	P -value
1. Monthly Self-income						**0.003**
> 10,000	129	36.4	1	1		
< 10,000	455	48.1	1.8	1.9	1.24-2.87	
2. Gender						**<0.001**
Female	274	39.8	1	1		
Male	310	55.5	1.9	1.9	1.33-2.64	
3. Age Range						**<0.001**
0-12	105	31.4	1	1		
13-35	206	46.6	1.9	2.0	1.21-3.34	
36-72	273	55.7	2.7	2.5	1.54-4.09	
4. Quality of Life in Social Relationship						**0.020**
Good	400	44.7	1	1		
Medium and poor	184	55.4	1.5	1.6	1.23-2.01	

Discussion

This study revealed that the suspected developmental delay among early childhood in Northeast of Thailand were 48.1% . The associated factors with suspected developmental delay were found 4 factors including: monthly self-income, gender, age range and quality of life in social relationship domain.

The association between Monthly self-income of caregivers and suspected developmental delay was consistent with Ozkan et.al[12], they found that economic and social factor effected to the delayed development.

Girls who are in normal development greater than boys were concordant with a study of Bhattacharya and Brito et al[13,14]. They found that boys were suspected developmental delay greater than girls. Nevertheless, it was different from a study of Ozkan et.al[12] reported that there was not difference on gender with suspected developmental delay.

Age range of the early childhood with developmental delay the most was 35-72 months which this result was consistent with problem about developmental delay on language domain which tended to increase up. A part of problem is environmental circumstance was not propitious to support the children development; for example, eating food following advertisement, leaving kids to use electric media alone, so the kid aged 3-5 years were slightly risky greater than the kid aged 0-2 years which were consistent with a study of Brito et al. and Celikkiran et al[14,15]., they found that infant stage had normal developmental better than preschool age.

Regarding to the caregiver's quality of life in social relationship is related to children development which also conformed to a study of Yamada et al[16]., especially mother who was in poor quality of life which her might get lower social support, it also affected to another family members on development, personality and children behavior.

Conclusion

The risky factors affected to the children development issue, biological factor slightly was lowering significant, but the socio-demographic characteristics factor was more important. Therefore, we should closely pay more attention to the risk factors which were biological, social and environmental factors which cause of children development issues. As a result, we should monitor these risk factors which might affect to the children in first five year in order to solve the problem and did any activities to stimulate and do support their normal developmental and being main human resource to develop our country in the future.

Research Ethics approval for this study was obtained from the Khon Kaen University Ethics Committee for human Research (HE622051).

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The Influence of ACTN3 Gene Polymorphism on VO2max and Sprint Speed Based on Sprint Interval Training Intervention

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Abstract

It is known that one of the physical fitness factors is a non-modifiable genetic factor, one of which is the ACTN3 gene. The influence of this gene polymorphism on physical fitness response, both aerobic and anaerobic, to intervention is still limited. Sprint Interval Training (SIT) as one intervention factor enhances physical fitness, both aerobic and anaerobic. The research aims at observing whether ACTN3 gene polymorphism influences VO2max and Sprint Speed with SIT intervention. VO2max is a parameter of aerobic physical fitness, while sprint speed is a parameter of anaerobic physical fitness.

Twenty-eight male students of 18-25 years old were taken as the research's subjects from the Student Activity Unit of Sports of Jenderal Soedirman University using the consecutive sampling method. The subjects were divided by genotypes identified using a PCR-RFLP method into three groups, namely RR, RX, and XX. All samples undertake three sessions of SIT per week for five weeks with work to rest ratio (W:R) = (1:8). Before and after undertaking SIT regimen, the subjects were examined for VO2max using a Multi-Stage Fitness Test method and for speed using a Sprint 30 m method. The analysis was conducted using a One-Way ANOVA test at a significance level of 0.05. There was a significant difference at mean value VO2MAX ($p=0.033$) and speed ($p=0.048$) with each genotype group, and the highest change takes place with the genotype group RR. Study concluded that ACTN3 gene polymorphism influences a change in VO2MAX and speed after Sprint Interval Training intervention.

Keywords: *ACTN3 gene, Vo2max, Sprint speed, Sprint interval training.*

Introduction

Physical fitness profoundly influences an athlete's performance. There are two components of physical fitness, namely aerobic fitness, and anaerobic fitness. Each sport requires different physical fitness with each other. The peculiarity of each sport makes the basis for sport practitioners to adjust their physical training and nutrition. The genetic factor is something extraordinary, which are often forgotten. Genetic factor determines about 20-80% of the individual's performance concerning physical fitness dominance [1]. Some individuals are born with aerobic physical fitness dominance and vice versa. ACTN3 gene is a gene which encodes the production of protein α-actinin-3 released by muscle fiber type 2[2]. Protein α-actinin-3 is responsible for the formation of fast and robust movement like a sprint[3]. ACTN3 gene has three polymorphisms, with polymorphism XX, the production of protein α-actinin-3 is less than with polymorphism RR. Previous researches on ACTN3 have proven that RR polymorphism has better anaerobic fitness. However, polymorphism's influence on the outcome of physical exercise has not been studied much, whether specific polymorphism tends to result in better physical fitness with a physical training intervention.

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Therefore, we were interested in observing how ACTN3 gene polymorphism influences physical fitness, both aerobic and anaerobic, with particular physical training intervention[3].

One physical training optimally enhances physical fitness, both aerobic and anaerobic, is Sprint Interval Training (SIT). Sprint Interval Training (SIT) is an intermittent physical training with training period (high intensity) followed with break period (low intensity)[4]. SIT is conducted with training period using short, continuous sprint with maximum workload interspersed with break period with light activities like jogging[5]. Constant training with the SIT method may enhance durability performance[6]. Such training shows a change to better muscle performance and adaptation than regular exercise with shorter training time. Study showed that high-intensity training like SIT with individual ration may progressively enhance recruitment of active type muscle fiber[7]. Therefore, SIT is deemed appropriate to be an intervention in observing how ACTN3 gene polymorphism influences physical fitness, both aerobic and anaerobic. Aerobic fitness parameter shall take VO2max, while anaerobic fitness parameter shall take sprint speed parameter.

Method

Research Design: This quasi-experimental research employed pre- and post-test design approach without a control group. The research subjects were classified based on the results of the ACTN3 gene polymorphism examination into three groups, namely RR, RX, and XX groups.

Research Subject: The 28 male of healthy students, aged between 20 to 25 years old, were divided into three groups, namely 10 students with RR polymorphism, 9 students with RX polymorphism and 9 students with XX polymorphism. The subjects were selected using a consecutive sampling technique. They regularly performed physical training with medium to high intensity at least 2-3 times per week for minimum the last three weeks. Subjects had to be a healthy man and pass the physical fitness examination; Physical Activity Readiness Questionnaire/PAR-Q.

Research Intervention: Sprint Interval Training (SIT) was performed for five weeks with a frequency of 3times/week at interval 1-2 days. SIT regimen employs a ratio of work to rest at 1:8, constituting sprint with an active period of 30 seconds, and the rest period of 4 minutes intermittently for four repetitions. The total duration for one session was 28 minutes, consisting of core training of 18 minutes, warming-up of 5 minutes, and cooling-down of 5 minutes. The consistent active period intensity took Borg's Scale of 14-18, regular active rest period brings Borg's Scale 10-13, and consistent warming-up and cooling-down intensity take Borg's Scale 10-13 [8].

ACTN3 gene polymorphism examination: The PCR-RFLP method examined the ACTN3 gene polymorphisms as previous study[9]. PCR was conducted using forward primer 5' CTG TTG CCT GTG GTA AGT GGG 3', and reverse 5' TGG TCA CAG TAT GCA GGA GGG 3'. The DdeI enzyme was used to digest PCR product 60 minutesin 37^0 C. An electrophoresis was conducted with agarose gel 2.5% at 100 volt for 50 minutes.

VO2 max examination: A change to VO_{2MAX} was examined using a Multi-Stage Fitness Test method with a run from one sign to another sign at a distance of 20 meters and in harmony with previously recorded sound. Subjects were required to follow the rhythm as long as possible and the test was ceased when subjects fail to reach the end of the 20m track for 2 stages or get exhausted[9,10].

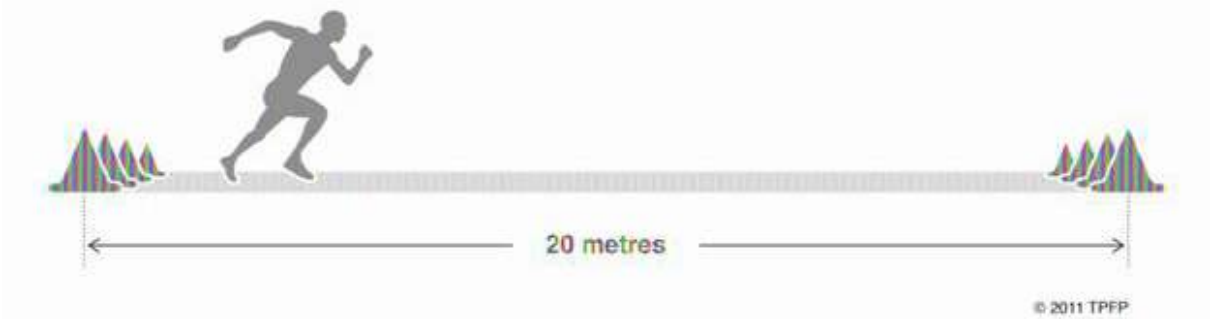

Figure 1. Multi-stage Fitness Test

Sprint Speed Examination:

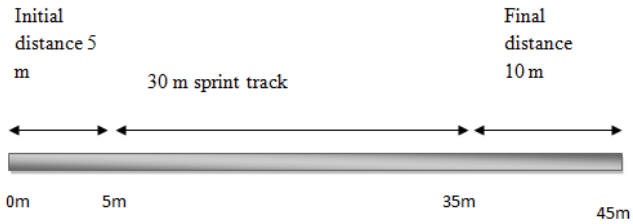

Figure 2. Sprint Speed Measurement Track

A change to sprint speed was examined with a sprint on a 30 meters track[11]. Additional 5 meters of initial distance was given to minimize any reaction time effect at the start of sprint on the travel time of 30 meters sprint. A final distance of 10 meters was given so that subjects may reduce their speed conveniently in prevention of injury risk.

Statistical Analysis: A change to VO_{2MAX} after SIT with all groups of ACTN3 gene was tested with a paired T-Test. The difference in the change to VO_{2MAX} after SIT between the ACTN3 gene groups was tested using One Way ANOVA. A Post Hoc test was employed as an advanced test to One Way ANOVA. The result of $p \leq 0.05$ was deemed significant.

Results

The baseline data of research subjects' age and body mass index (BMI) with each group are presented in Table 1. Table 1 shows that the age and BMI of subjects between groups are relatively equal, with the highest mean age is of RR group (21.10 ± 1.28 years old) and the highest mean BMI is of RR group (23.60 ± 1.24 kg/m^2).

Table 1. Characteristics of Age and Body Mass Index (BMI) among Subjects

Variable Characteristics	RR	RX	XX
Mean Age (years) ± SD	21.10 ± 1.28	20.50 ± 1.58	20.70 ± 1.15
Mean BMI (kg/m^2) ± SD	23.60 ± 1.24	22.44 ± 2.03	23.16 ± 1.95

The Paired T-test results show that there is significant difference in both speed variable and VO2 max before and after SIT intervention variable (Table 2).

Table 2. Paired T-Test results between Speed and VO2max Correlation

Variables	Pre SIT(mean±SD)	Post SIT (mean ± SD)	P Value
Speed	7.24 ± 0.50	7.51 ± 0.59	0.000
VO2max	35.29 ± 4.60	43.39 ± 5.63	0.000

The one way ANOVA test results (Table 3) show that the change to sprint speed and VO2max after SIT is statistically different between the ACTN3 gene groups with p = 0.048 for speed and p = 0.033 for VO2max ($p < 0.05$).

Table 3. One Way ANOVA Test Results comparing the Genotypes and Interventions

Variables	Pre SIT (mean ± SD)	Post SIT (mean ± SD)	Variable Change	P Value
Speed				
RR	7.55 ± 0.35	8 ± 0.37	0.45	
RX	7.12 ± 0.53	7.51 ± 0.56	0.39	0.048
XX	7.04 ± 0.50	7.26 ± 0.47	0.22	
VO2max				
RR	37.43 ± 6.01	47.45 ± 6.46	10.02	
RX	35.37 ± 4.40	34.28 ± 4.15	1.09	0.033
XX	34.28 ± 4.15	42.32 ± 5.32	8.04	

The Post-Hoc analysis to observe polymorphism group with significant difference revealed that significant difference takes place with RR and XX groups for speed (p=0.017) and RR and RX groups for VO2max (p=0.010). The highest improvement of speed and VO2max takes place with RR polymorphism group.

Discussion

This research proves that Sprint Interval Training intervention may enhance speed and VO2max. SIT training is one method of HIIT (High Intensity Interval Training), in which HIIT is defined as a high intensity training consisting of aerobic and anaerobic combination. High intensity training for individual will give benefit of enhancement of muscle mass, while low intensity training will enhance mitochondrial mass and oxidative enzyme activity[3]. A Study reported that HIIT training is correlated with recruitment of type IIa muscle fiber[12]. This theory reflect the informationthat high intensity training will change the composition of muscle fiber, from type I and type IIx muscle fiber to type IIa muscle fiber. Type IIa muscle fiber is muscle fiber with components almost equal to type I muscle fiber, in which the components include number of mitochondria, capacity of oxidative phosphorylation and capillary content[13,14]. The components may support muscle metabolism in a training which requires durability or VO2max. Previous researches also prove that SIT training performed for about 5 weeks shows a change to skeletal muscle metabolism, that it increases creatine kinase enzyme (creatine phosphate catalysis) and myokinase enzyme (resynthesis of ATP from ADP) with phosphate system[15,16]. Such improvement of creatine kinase and myokinase enzymes gives certain benefit to sport which requires speed like sprint. Therefore, performing SIT training will obtain double benefits in the form of enhancement of aerobic performance, in this case with enhancement of VO2max, and also enhancement of anaerobic performance, as shown with enhanced performance of sprint speed.

Furthermore, it proves that ACTN3 gene polymorphism influences speed and VO2max enhancement response with SIT intervention. The best enhancement of speed and VO2max is with RR gene polymorphism. Genotype RR with ACTN3 will encode the formation of protein α-actinin 3 the most. Skeletal muscle with protein α-actinin 3 has type 2 muscle fiber which works faster and is able to make more maximal contraction than muscle fiber without protein α-actinin 3 (XX)[17]. The reason is that protein α-actinin 3 interacts with calcium and calmodulin-dependent protein phophatase calcineurinso that protein α-actinin 3 may make more distribution of type II muscle fiber[18]. More type II muscle fiber causes better speed. In addition, mass enhancement of type IIa muscle fiber causes enhancement of durability in training.

Previous study on the rats to examine the difference in muscle biochemical characteristics found that the activities of Citrate synthase is found higher with type IIa muscle fiber than with any other type of muscle fiber[19]. Itcatalyze acetyl-CoA in krebs cycle of muscle cell oxidative metabolism track. Such enhanced activity of citrate synthase makes type IIa muscle fiber able to have stronger durability than any other type of muscle fiber[20].

It has beenproposed that m TOR and p70S6k phosphorylation are higher with ACTN3 gene R allele after physical sprint training[21]. mTOR and p70S6k phosphorylation serve to regulate skeletal muscle hypertrophy[22]. Therefore, we may conclude that hypertrophy and strength enhancement of skeletal muscle will be higher with individual with R allele after certain period of physical training. Moreover, another study also propose that testosterone level in male and female athletes is higher with individual with ACTN3 gene R allele[23]. This allows individual with R allele to have higher enhancement of muscle strength with physical training intervention, particularly resistance training. Similarly, the same occurs with the influence of ACTN3 on VO2max enhancement during SIT training. VO2 max is higher with genotype XX. However, after endurance training, the highest VO2 max enhancement takes place with individual with RR allele[24].

The influence of ACTN3 gene, particularly RR polymorphism, on the performance makes ACTN3 gene called “a gene for speed”. Researches show that ACTN 3 gene influences training adaptation, which in this case is speed and VO2max enhancement response during SIT. Moreover, ACTN3 evidently influences not only training adaptation, but also recovery speed during training and reduces injury risk [25].

This research is limited that it does not recall respondents’ nutrition, while it is possible that respondents’ energy during measurement may influence the result. Nutrition like high carbohydrate and protein may influence training adaptation.

Conclusion

The ACTN3 gene polymorphism influences a change to speed and VO_{2MAX} after Sprint Interval Training (SIT) intervention. The best response take place with genotype RR group.

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Ethical Clearance: The research has been reviewed by Ethical Committee of Health Research, Faculty of Medicine, Universitas Jenderal Soedirman.

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Predisposing Factors to Risk of Low Birth Weight in Premature Baby in Bengkulu Indonesia

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Abstract

Introduction: Birth weight is the most important factor which determines the survival of newborns. Low birth weight (LBW) is one of the challenges in maternal and child health and most are caused by preterm labor. Exposure to prenatal or postnatal cigarette smoke has a detrimental effect on fetal and infant health including premature birth. This study was conducted in Bengkulu Province which aims to determine the magnitude of maternal predisposing factors influence on the LBW in preterm birth.

Method: This was research with a cross-sectional design which used a questionnaire on 95 premature babies born in January to October 2018 in the Bengkulu Province, Indonesia. Predisposing factors studied including smokers in family members, mother's age, mother's education level, mother's occupation, gestational age and gender of the baby. Data were analyzed using multivariate logistic regression.

Result: On average, premature babies were born at 32.9 weeks of gestation, 81.1% of babies born with LBW, most of the samples have family member who smokes (85.3%), most mothers participated aged 26-35 years (46.3%), most mother's education level was moderate (45.3%), and most mother's occupation was house wived (70.5%). In the multivariate variable analysis, the predisposing risk of experiencing very low birth weight (VLBW) including smoker in a family member (OR=8.79, 95% CI 1.54-50.35), gestational age (OR=0.63, 95% CI 0.49-0.82), and mother's age of 26-35 years (OR=1.47, 95% CI 1.59-134.73).

Conclusion: Smoker in a family member, Mother's age, gestation age, and Mother's private employee has a significant risk of LBW in premature babies in Bengkulu Province.

Keywords: *Predisposing factors, Low birth weight, Premature baby.*

Introduction

Quality health care before, between and during pregnancy will ensure all women have a positive pregnancy experience. Preventing death and complications from preterm birth begins with a healthy pregnancy. The study conducted by Sheeba et al., (2019) showed that preterm labor and low birth weight (LBW) had an impact on increasing stress on the mother[1]. According to Aryastami et al., (2017) LBW is a stunting-related factor among children aged 12-23 months in Indonesia[2].

Premature birth is the birth of a baby which occurs before 37 weeks of pregnancy. Premature births can be categorized into four subgroups, namely late preterm (34-36 weeks of pregnancy),moderate preterm (32-34 weeks of pregnancy), very preterm (<32 weeks of pregnancy, and extremely preterm (<28 weeks of pregnancy). Premature birth can also be defined as the low birth weight (less than 2500 grams), very low birth weight (less than 1500 grams), and extremely low birth weight (less than 1000 grams)[3].

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An estimated 15 million babies born prematurely every year. Around 1 million children die every year due to complications of premature birth[4]. In low-income countries, an average of 12% of babies was born too early compared to developed countries (9%). Indonesia is among the ten countries with the highest number of preterm births and is also one of 10 countries with the highest preterm birth rate per 100 live births[5].

Many factors contribute to LBW and preterm birth. Endalamaw et al., (2018) in a systematic study review and meta-analysis showed that mothers aged <20 years and mothers who did not have formal education were significant factors of experiencing LBW. Female infants were not associated with LBW and gestational age of fewer than 37 weeks was positively associated with LBW[6]. Khurana et al., (2017) study used a cross-sectional method in tertiary care hospitals in Gurugram and found that maternal education, maternal occupation, socioeconomic status, and family type were found to be significantly associated with LBW in multivariate analysis[7].

Mothers involved with the use of nicotine and tobacco burning during pregnancy have a higher risk of experiencing small-for-gestational-age (SGA) births, and products containing nicotine should be avoided during pregnancy[8]. Babies born to fathers who smoke and both parents who smoke >20 cigarettes/day significantly increase the risk of LBW and preterm birth. Fathers who smoke >20 cigarettes/day have a higher risk of having LBW babies than non-smokers[9]. Mothers who smoke have a higher incidence of LBW, SGA, and premature babies, especially when the mothers smoke >20 cigarettes/day. There is a significant relationship between fathers smoking with LBW, SGA, and premature babies born[10].

Prenatal or postnatal cigarette exposure has a detrimental effect on fetal and infant health, including preterm birth and this is very important because it can cause infant death. This study aimed to determine the predisposing factors which influence the LBW in preterm birth.

Method

This study was a cross-sectional study design. Data was collected using a questionnaire filled in by the mother of the preterm baby. The population of this study was preterm babies born less than 37 weeks gestational age and birth weight less than 2500 grams in the Bengkulu Province, Indonesia. The study sample of 95 infants born from January to October 2018 was taken incidentally after discharge from the Regional General Hospital and independent practice midwives. Independent variables in this study were predisposing factors which included smoker family members, mother's age, mother's education level, mother's occupation, gestational age and gender of the baby.

The collected data were analyzed using the chi-square test on gender variables, exposure to cigarette smoke, mother's education level, mother's occupation, and mother's age while gestational age was analyzed using the Mann-Whitney test. All variables found significant ($p<0.25$) were analyzed further with multivariate analysis using logistic regression to estimate odds ratios (OR) and 95% confidence intervals (CI).

Result

Frequency distribution of baby's gender, exposure to cigarette smoke, mother's education level, mother's occupation, mother's age and LBW in the Bengkulu Province can be seen in table 1. On average, preterm baby in this study was born at 32.9 weeks of gestational age, and most of them (81.1%) are LBW babies. Most respondents (85.3%) were exposed to cigarette smoke. Nearly half (46.3%) of the mothers aged 26-35 years, almost half (45.3%) of the mother's education level was moderate, and most (70.5%) of the mother's occupation was a full-time mother.

Table 1. Relationship of predisposing factors (smoker in a family member, mother's age, mother's education level, gestational age, mother's occupation, the gender of the babies with LBW).

Variable	Low Birth Weight		Total n (%)	p-value
	LBW n (%)	VLBW n (%)		
Smoker in a family member				
No	8(57.1)	6(42.9)	14(100)	0.023*
Yes	69(85.2)	12(14.8)	81(100)	

Variable	Low Birth Weight		Total n (%)	p-value
	LBW n (%)	VLBW n (%)		
Mother's age				
≥36 years	8(57.1)	6(42.9)	14(100)	0.045*
26-35 years	37(84.1)	7(15.9)	44(100)	
≤25 years	32(865)	5(13.5)	37(100)	
Mother's education level				
High (bachelor)	15(75)	5(25)	20(100)	0.701
Moderate (high school)	35(81.4)	8(18.6)	43(100)	
Low (elementary school, junior high school)	27(84.4)	5(15.6)	32(100)	
Gestational age				
Mean ± SD	33.5±2.43	30.2±3.39		0.000*
Mother's occupation				
Civil government employee	3(42.9)	4(57.1)	7(100)	0.019*
Private employee	19(90.5)	2(9.5)	21(100)	
Fulltime mother	55(82.1)	12(17.9)	67(100)	
Baby's gender				
Female	35(77.8)	10(22.2)	45(100)	0.440
Male	42(84)	8(16)	50(100)	

*multivariate candidate variables

Table 2. Logistic regression multivariate analysis

Predisposing factors	OR	95% CI	p-value
Smoker in a family member	8.79	1.54-50.35	0.015
Mother's age of 26-35 year	1.466	1.59-134.73	0.018
Gestational age	0.63	0.49-0.82	0.000
Mother's private employee	1.168	1.27-107.89	0.030
Housewife	0.316	0.04-2.47	0.272

The results of the analysis showed that mothers with a smoker in family members had a higher risk of LBW compared to mothers whose family members were not smokers (OR 8.79, 95% CI 1.54-50.35). Gestational age had a risk of giving birth to LBW babies (OR 0.63, CI 95% 0.49-0.82), and mother's age of 26-35 years tends to increase the risk of experiencing VLBW compared to the mother's age of ≤25 years (OR 1.47 and 0.27). These data can be seen in table 2.

Discussion

This study has a significant relationship between smoking families with LBW in preterm infants. Mothers who were exposed to cigarette smoke by their families who smoke are protective factors against the VLBW of babies. Previous research according to Mumbare et al., (2011) found that exposure to cigarette smoke poses a risk of LBW (OR=4.10, 95% CI 1.85-9.06)[11]. Ashford et al., (2011) stated that prenatal exposure to passive smoking puts women at higher risk for premature birth (OR=2.3)[12].

Furthermore, according to Qiu et al., exposure to passive smoking during pregnancy was associated with an increased risk of <32 weeks of very preterm birth (OR=1.98, 95% CI 1.41-2.76)[13]. It is also in line with Nieuwenhuijsen et al., (2013) study which found that there was a statistically significant relationship between environmental exposure such as tobacco smoke, air pollution and chemicals, and pregnancy outcomes, including LBW (OR=1.32) and SGA (OR=1.21)[14]. Cui et al., (2016) found that the significantly increased risk of preterm birth was associated with exposure to passive smoking at home (OR=1.16, 95% CI 1.04-1.30)[15]. Fathers who smoke >20 cigarettes/day have a much higher risk of having LBW babies than non-smokers (OR=2.09, 95% CI 1.38-3.17)[5].

Pregnant women exposed to environmental smoke cigarettes during pregnancy experienced an adverse effect on the mother and fetus such as impaired fetal growth, LBW, preterm labor, and increased fetal and infant mortality, indicating that the number of pregnant women exposed to environmental cigarette smoke is still high due to the high number of families who smoke. However, this finding is different from the study by

Elkin et al., (2018). The study assessed the relationship between exposure to Environmental Tobacco Smoke (ETS) and preterm birth and showed inconclusive results[16].

Gestational age has a significant relationship to the weight of the baby born. The results of another study conducted by Anitha et al., (2009) found that gestational age is one of the risk factors which can affect infant birth weight (R2=141.98, 95% CI 123.74-160.22)[17]. Xia et al., (2016) found that LBW cases were significantly associated with gestational age (OR=1.81, 95% CI 0.90-3.67)[18].

The results of this study are in line with the research of Akanksha et al., (2017) which found that the relationship between maternal age and LBW of the newborns was statistically significant (OR=0.022)[7]. Foto et al., (2016) found that mothers' age of 20-34 years significantly decreased the risk of giving birth to an LBW baby (OR=0.681)[19]. The findings of Cui et al., (2016) showed that mother's age was significantly associated with preterm birth (OR=1.27, 95% CI 1.09-1.47)[15]. This finding is different from the result of Bhaskar et al., (2015) study which found that mother's age has no significant relationship with LBW[20].

In this study, mother's education level showed no significant relationship to the LBW babies because other factors were more influential on the occurrence of LBW such as gestational age, a smoker in family members, and mother's age. This study found that most mothers with moderate education level (45.3%) gave birth to babies with LBW (81.4%) and VLBW (18.6%). This research is in line with Mumbare et al., (2011) study which stated that mother's education level was not significantly related to the birth of LBW babies[7]. This finding is in contrast to the opinion of Akanksha et al., (2017) which stated that there was a statistically significant relationship between maternal education and LBW (OR=0.192). The study also said that educated women should have a better awareness of available health services and information[19].

Mother's occupation showed no significant relationship with LBW, this is consistent with the study conducted by Demelash et al., (2015) which found that the mother's occupation was not a risk factor of LBW[21], but different from the study conducted by Akanksha et al., (2017) which found that unskilled occupation was a risk factor for LBW (OR=0.184)[7].

In this study, the mother's occupation was mostly categorized as other (70.5%), which in this case was housewives. As a housewife, they were not required to do heavy work, and house chores can be done according to the mother's physical abilities; also the mother can rest any time she was exhausted. Mother's occupation does not affect the occurrence of LBW, more likely due to other factors including gestational age.

Pregnant women should always maintain the health of themselves and their fetuses. The LBW is not only caused by diseases during pregnancy such as preeclampsia, anemia, and others but also can be caused by predisposing factors. A pregnant woman should avoid exposure to cigarette smoke and women preferably pregnant in productive age. Besides, mothers and families should avoid the occurrence of pregnancy in those who are too young or too old and alert for the possibility of preterm labor.

Conclusion

The results of this study indicate the predisposing factors which influence LBW, including smokers in family members, mother's age, gestational age and mother's occupation while the variables at risk for VLBW are smokers in family members (OR=8.79, 95% CI 1.54-50.35), gestational age (OR=0.63, 95% CI 0.49-0.82), and mother's age of 26-35 years (OR=1.47, 95% CI 1.59-134.73).

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Education and Knowledge Level Analysis of the Teachers Regarding Dental Education Program in Primary Schools

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Abstract

Introduction: The highest caries prevalence occurs in the age group 10-14 which is the age of school children. Increased teacher knowledge about dental and oral health will determine students in behaving to maintain oral health.

Objective: This study aimed to determine the level of education towards the level of knowledge of dental and oral health and School's Dental Education Program for kindergarten and elementary school teachers.

Method: This was an observational descriptive study with cross sectional approach. The population of this study were kindergarten and elementary school teachers in Public Health Center working area in Surabaya with a total sample size of 76 respondents.

Results: Chi-Square analysis of education level did not correlate with the level of dental and oral health knowledge and School's Dental Education Program ($\rho = 0.951$ and $\rho = 0.098$).

Conclusion: There was no relationship between the level of education on the level of knowledge of dental and oral health and School's Dental Education Programfor kindergarten and elementary school teachers.

Keywords: *Dental education, Education status, Knowledge, Oral health,*

Introduction

Data from basic health research (RISKESDAS) in 2013 showed that the national prevalence of oral and dental health problems was 25.9%. East Java Province ranked third with the highest increase in dental and oral problems in 2007 of 20.3% and in 2013 it increased to 28.6%[1]. The highest caries prevalence occurred in the age group of 10-14 years which is the age of school children which is equal to 25.2%[2].

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Based on secondary data on visits of children at the Dental Clinic of health center, pulpitis was found to be a common health problem. In July 2017 until May 2018 the diagnosis of diseases ranked first in children was pulpitis. Children with pulpitis in July 2017 until May 2018 were as many as 118 children.

In the study of the caries severity of elementary school students in Surabaya health center in 2017, based on the DMF-T index, it showed mean of 5 of the total range of 0 to 15. According to WHO, this value is categorized as high.

Teachers are parents in school for children because they have a high responsibility for education that their students have to obtain in order to acquire knowledge. Such knowledge can help students and distinguish good and bad habits. In addition, teachers must have proper knowledge so that it can be channeled to their students to

aim the target[3]. An increase in the proper knowledge of teachers about dental and oral health will determine how students behave in maintaining oral health. Teachers have a role to prevent the occurrence of oral problems, such as caries, which in general often occurs in children in school age due to lack of knowledge of children in maintaining dental and oral hygiene and eating habits in schools of cariogenic food[4].

Based on the results of previous research regarding the relationship between education level, age, and years of work with the level of dental and oral health knowledge in elementary school teachers in Tampak Siring, Gianyar sub-district, shows that the more mature the level of maturity and strength a person, the more mature his/her thought and the higher his/her knowledge[5].

In the Health Center Performance Assessment in October-November 2017, the health center had carried out School's Dental Education Program (School Oral Health Program) activities covering 3934 students in Grade 1 of the total target of 3534 students. Students in grades 1-6 receiving treatment were 3505 students from a total target of 1402 students. Whereas, the target for elementary/Islamic elementary schoold with School's Dental Education Program Phase III of 30% of the total SD/MI targets was 9 schools and 8 out of it had been implemented.

The Indonesian government seeks to improve the dental health knowledge of elementary school-age children through the School Dental Health Program. According to the Republic of Indonesia Ministry of Health's Decree of the Director General of Health Care Development no. HK.02.04/II/963/2012, School's Dental Education Programis a public health effort aimed at maintaining, improving the dental and oral health of all students in school.

Based on what has been described above, it is necessary to conduct research on the analysis of education level on knowledge level of dental and oral health and School's Dental Education Programfor kindergarten and elementary school teachers in the working area of health center in Surabaya.

Subjects and Method

This research was carried out by observational descriptive method with a cross sectional approach in the urban area of health center in Surabaya. The population in this study were kindergarten and elementary school teachers in the working area of the urban area in the Surabaya's public health center with a total sample taken in total sampling. The number of samples in this study were 76 respondents.

This research was conducted in June 2018. Data were collected in 4 elementary schools and kindergartens in the coverage area of the Surabaya's Public health center. Before taking the subject of research in total sampling technique, the licensing process was carried out to the authorities at health center and schools, then the researcher collected teachers' data by stating the last name, gender, age, and education.

In this study the level of knowledge and understanding of dental and oral health and an understanding of School's Dental Education Program was carried out by filling out questionnaires by teachers at the kindergarten and elementary school level in health center area. The data obtained were analyzed using Chi Square Test to observe the relationship between variables in this study.

Findings:

Table 1. Respondents' Sex Frequency Distribution Regarding Knowledge of Dental and Oral Health and School's Dental Education Program Knowledge.

Sex	Dental and Oral Health Knowledge			School's Dental Education Program Knowledge		
	High	Low	Total	High	Low	Total
Female	9 (13%)	57 (87%)	66 (100%)	47 (72%)	19 (28%)	66 (100%)
Male	0 (0%)	10 (100%)	10 (100%)	6 (60%)	4 (40%)	10 (100%)

Based on Table 1, it can be seen that the level of knowledge about dental and oral health is high (13%) and low (66%) in female. So does the level of knowledge about School's Dental Education Program is high (72%) and low (28%) in women.

Table 2. Age Frequency Distribution of Respondents on Knowledge of Dental and Oral Health and School's Dental Education Program Knowledge

Age	Dental and Oral Health Knowledge			School's Dental Education Program Knowledge		
	High	Low	Total	High	Low	Total
<35 years	4 (13%)	27 (87%)	31 (100%)	23 (74%)	8 (26%)	31 (100%)
>35 years	5 (11%)	40 (89%)	45 (100%)	30 (67%)	15 (33%)	45 (100%)

Based on Table 3, it can be seen that the level of knowledge about dental and oral health is mostly low at age >35 (89%), and the lowest high value was at age <35 years (13%).The table shows that the level of knowledge about School's Dental Education Program is mostly high at age <35 years (74%) and low at age <35 (26%).

Table 3. Frequency Distribution of Respondents School Status Regarding Knowledge of Dental and Oral Health nad School's Dental Education Program Knowledge.

School status	Dental and Oral Health Knowledge			School's Dental Education Program Knowledge		
	High	Low	Total	High	Low	Total
Public	4 (13%)	26 (87%)	30 (100%)	21 (70%)	9 (30%)	30 (100%)
Private	5 (11%)	41 (89%)	46 (100%)	32 (70%)	14 (30%)	46 (100%)

Based on Table 5, it can be seen that the level of knowledge about dental and oral health is mostly high in public schools (13%) and mostly low in private schools (89%). While the level of knowledge about School's Dental Education Program that the status of schools both public and private have a high level of School's Dental Education Program Knowledge.

Table 4. Frequency Distribution of Respondents' School Level Regarding Knowledge of Dental and Oral Health and School's Dental Education Program Knowledge.

School Level	Dental and Oral Health Knowledge			School's Dental Education Program Knowledge		
	High	Low	Total	High	Low	Total
Kindergarten	5 (11%)	42 (89%)	47 (100%)	36 (77%)	11 (23%)	47 (100%)
Elementary School	4 (14%)	25 (86%)	29 (100%)	17 (59%)	12 (41%)	29 (100%)

Based on Table 7, it can be seen that the level of knowledge regarding dental and oral health is mostly high in elementary school (14%) and mostly low in kindergarten (89%) and the level of knowledge about School's Dental Education Program is mostly high in kindergarten (77%) and mostly low in elementary school (41%).

Table 5. Chi-Square Analysis of Dental and Oral Health Knowledgeand School's Dental Education Program Knowledge based on Respondent's Education Level

Education Level	Dental and Oral Health Knowledge			
	High	Low	Total	ρ -Value(Chi-Square)
Bachelor	8(12%)	60(88%)	68(100%)	.951
Non-bachelor	1(12.5%)	7(87.5%)	8(100%)	
Education Level	**School's Dental Education Program Knowledge**			
	High		**Low**	**Total**
Bachelor	48(71%)		20(29%)	68(100%)
Non-bachelor	5(62.5%)		3(37.5%)	8(100%)

Based on Table 5, it can be seen that the level of knowledge about dental and oral health is mostly high in non-bachelor (12.5%) and mostly low in bachelor (88%). Chi-Square test results show ρ value = 0.951 (>0.05), indicating that there was no relationship between knowledge skills and education level. The table also shows that the level of knowledge about School's Dental Education Program is high in bachelor (71%) and mostly low in non-bachelor (37.5%). Chi-Square test results shows ρ value = 0.098 (>0.05), so it can be concluded that there was no relationship between School's Dental Education Program knowledge and education level.

The results of the test analysis showed the results of the Chi-Square test with ρ results = 0.591 (> 0.05). On the results of the Chi-Square test about the level of School Dental Health Program knowledge on the level of education, ρ results = 0.098 (> 0.05) was obtained. The results of the two Chi-Square tests showed that there was no relationship between the level of education and the level of knowledge of dental and oral health and School Dental Health Program. The level of one's knowledge is not only influenced by education level factors. There are still many other factors that influence it, so the results of the study provide insignificant results between the level of knowledge and the level of education. Similar research shows that there is no relationship between the level of education and the knowledge of women about breast cancer risk factors with ρ results = 0.192 (> 0.05)(6).

In the previous study, it was stated that the factors that affect the level of knowledge are not only from the level of education, but there are still other factors that influence it, including work and information media. Someone who works in a particular profession will have a level of knowledge related to his/her profession. For example, people will be called laymen of having limited health knowledge if they do not involve in the world of health or not work as health workers. Therefore, occupational factors play an important role in measuring a person's level of knowledge and not only from the level of education[6]. A person's occupation is very influential on the process of accessing information needed on an object[7]. The performance and ability of a person's brain in storing (memory) increases when it is often used. This is directly proportional when someone's occupation uses the brain more than muscles. A person's brain or cognitive abilities will increase when it is often used for activities and doing things in the form of puzzles or reasoning[6].

Furthermore, information media factors will also influence the level of knowledge. Even though a person has low education level, but if he/she acquires good information from various information media, for example: TV, radio, or newspapers, his/her knowledge still may increase[6]. In the era of communication and information, the mass media cannot be left behind to participate in conveying important information to the public and adolescents in general[9].

Apart from these two factors, there are other factors that influence the level of knowledge, i.e. experience. A person's experience greatly influences knowledge. The more a perso''s experience about an aspect, the more one's knowledge will increase[7]. The more the age, the level of maturity and strength of a person will be more mature in thinking and working. However, Verner and Davison stated that there are 6 physical factors that can inhibit the learning process in adults, thus making a decline at a time in the power of thinking and working [10]. So, through prior knowledge, personal experience, experience of others, the environment and other intrinsic factors can shape a person's knowledge for a long time and will survive until old age. This is in accordance with previous research which shows that there is a relationship between knowledge and practice among school children in Ajman University of the United Arab Emirates with a significant ρ value = 0.001 (<0.05)[11].

Another factor that affects the level of knowledge is interest. A previous study by Hayati (2007) in Wardani (2014) stated that the higher a person's interest in something, the higher the level of knowledge[12].

Some studies also explain that the age of a person at a productive age has the best level of knowledge or cognition. In addition, at that age, a person also has extensive experience and abilities for activities which will certainly support his/her knowledge in all aspects[13,14]. At the age of 20-35 years, individuals will play an active role in society and social life and prepare more for the success of efforts to adjust to old age. In addition, they will use more time to read more[8]. The age of a person influences one's perception and mindset. Increasing age will also develop the ability to capture and mindset, so that the knowledge gained is getting better[15,16].

Conclusion

There was no relationship between the level of education on the level of knowledge of dental and

oral health and School Dental Health Program for kindergarten and elementary school teachers in the working area of health center in Surabaya.

Conflict of Interest: Nill

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Ethical Clearance:

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Revised Trauma Score (RTS) as Outcome Predictor of Head Injury Patients

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Abstract

Head injury is the condition of brain function changes or pathological conditions in brain caused by the pressure that coming from the outside of brain. The occurrence of head injury is very high in the world followed by the level of death and disability. Therefore, requires initial assessment to predict the impairment of head injury patients by using RTS. This study purposed to determine the accuracy of RTS in predicting impairment of head injury patients. This study used analytical observational design with retrospective approach. Total respondents in this study was 245 medical records of head injury patients. Measurement was conducted by using observation sheet. Data were analyzed using *Receiver Operating Characteristic* (ROC). The AUC values of RTS was 0851, explained that RTS had a good discrimination value. RTS could be used in predicting the outcome of head injury patients

Keywords: *Head injury, RTS, impairment.*

Introduction

Head injury is the condition of brain function changes or pathological conditions in brain caused by the pressure that coming from the outside of brain [1]. Head injury is being one of important problem in the world [2]. In the United States, head injury cases had increased from year to year. A survey conducted in 2001-2010 described the number of injured reached 2.5 million people. The occurrence of head injury caused by fall incident. CDC also explained that on average 138 people died due to trauma in which one of the most trauma cases causing death was head injury [3].

International Brain Injury (IBIA) (2016) explained that head injury being the highest cause of death and disability throughout the world. Head injury that occurs in the world caused by traffic accidents [4]. Traffic accidents caused the deaths of 1.2 million people/year. Traffic accidents also caused permanent disability [5].

The occurrence of head injury in Indonesia had not been recorded properly. The occurrence of head injury can be seen from the high incidence of traffic accidents and the prevalence of patients who have experienced trauma, especially head injuries in the hospital. The occurrence of traffic accident in Indonesia in 2017 reached up to 98 419 cases, with the death toll reached 25 859 people and seriously wounded reached 16 159 people [6]. The high incidence of traffic accidents caused high incidence of traumatic head injury which reached 47.5% of total traffic accidents [7].

The high incidence and mortality in patients with head injury illustrates the need for good management in the form of a quality service. Quality service is a challenge for medical staff in providing services mainly in providing proper medical action in dealing with head injury patients [8]. Handling of head injury patients is very dependent on the accuracy of the initial assessment of patients [9]. Accurate initial assessment of patients is needed to provide appropriate treatment and predict the outcome of the next patient, especially impairment of the patient [10]. With an accurate initial assessment, medical staff can provide the action in accordance with

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the patient's condition. In addition, the initial assessment is also the information needed by medical staff and the patient's family in seeing the next patient's prognosis [11]. The initial assessment of patients can be conducted by using scoring system [12].

The scoring system is a tool to predict patient outcome in the future [12]. The scoring system has been developed in the world, one that is commonly used scoring system is revised trauma score (RTS). RTS is a scoring system developed in 1989 by Champion et al and are often used in predicting outcomes in trauma patients [13,14]. RTS has three assessment variables that are GCS (glasglow coma scale), respiratory rate and systolic blood pressure [15]. RTS become one of the scoring system that can be used to predict the impairment of the patient. Research conducted by Kim et al (2017) stated that RTS can predict mortality in trauma patients [16]. This experiment also supported by Jung et al (2016) describes the RTS also excellent in predicting mortality in trauma patients [17].

Preliminary study that carried out by researcher in General Hospital of dr. Slamet Martodirdjo, there was an increasing number of patients with head injuries from 2017 to 2018. In 2017, head injury patients reached up to 281 people and in 2018 the head injury patients reached 352 people. The highest incidence of head injuries caused by traffic accidents. Interviews conducted by researchers with medical staff, stated that they have not implemented the scoring trauma to predict the patient's condition. Based on the above background, the researchers are interested in conducting research by using RTS in predicting impairment of head injury patients.

Method and Material

This study used analytical observational design with retrospective approach. Total respondents in this study was 245 taken from medical records of head injury patients through purposive sampling method in General Hospital of dr. Slamet Martodirdjo Pamekasan on 19 February 2019 to 5 March 2019. The research instrument used was observation sheet. GAP assessment using comparative method of ROC in determining AUC, the cut-off point, the sensitivity and specificity of RTS.

Results

Univariate:

Table 1: Characteristics of Respondents based on RTS Score, Age, Systolic blood pressure, GCS and Respiration

Variables	N	Mean	Median	Min-Max	SD
RTS score	245	10:36	11	7-12	2904
Age	245	49.29	47	25-65	12.73
Systolic blood pressure	245	97.68	95	68-134	21 744
GCS	245	12:31	13	7-15	2,636
Respiration	245	22:04	20	7-36	8:26

Source: Primary Data (2019)

Based on table 1, the highest RTS score was 12 and the lowest was 7 with mean value of 10.36. The oldest respondent was 65 years old and the youngest was 25 years old with mean value of 49.29 years old. The highest systolic blood pressure of patients was 134 mmHg and the lowest was 68 mmHg with mean value of 97.68 mmHg. The highest patient GCS score was 15 and the lowest was 7 with mean value of 12.31. The highest patient respiration rate was 36x/minute and the lowest was 7x/minute with mean value of 22.04x/minute.

Table 2: Characteristics of Respondents based on Impairment, RTS Category, Gender, Head Injury and Head Injury Mechanism

Variables	Category	Frequency	%
Impairment	No impairment	160	65.3
	Impairment	85	34.7
Gender	Man	190	77.6
	woman	55	22.4
Head injury	Mild head injury	138	56.3
	Moderate head injury	81	33.1
	Severe head injury	26	10.6
Mechanism of injury	Fall down	73	29.8
	Traffic accident	172	70.2

Source: Primary Data (2019)

Table 2 explained the most dominant respondents who did not experience impairment with total respondents of 160 people (65.3%). The gender of respondents was dominated by male with total of 190 respondents (77.6%). The respondent's head injury was the most dominant categorized as a mild head injury with 138 respondents (56.3%). The most dominant mechanism of respondent's head injury was caused by traffic accident with total of 172 respondents (70.2%).

ROC Analysis:

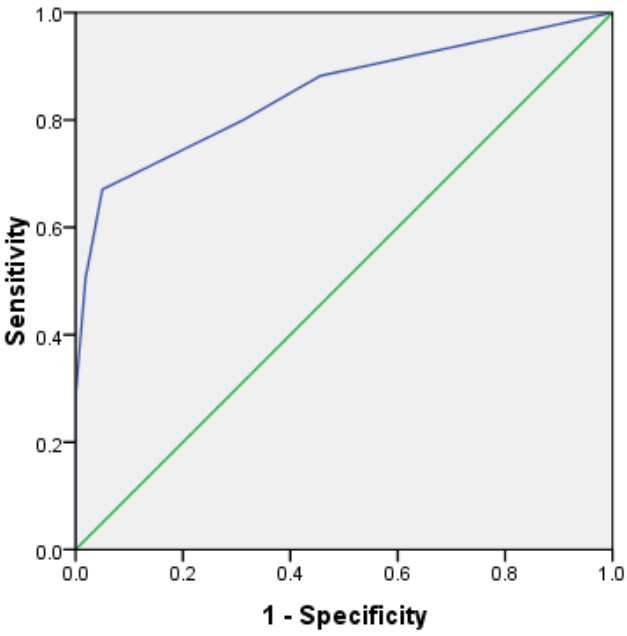

Figure 1: ROC curve of RTS

Table 3: Description of Area Under Curve (AUC) Value of RTS

	AUC	Std. Error	p-value	CI 95%	
				LB	UB
RTS Scores	0851	0029	0000	0796	0907

Source: Primary Data (2019)

Table 3 shown that RTS had a value of p=0.000 and AUC was 0.851 which explained that RTS could be a strong predictor of impairment in head injury patients.

Table 4: Cut off Point, Sensitivity and Specificity of RTS

	Cut off Point	Sensitivity	Specificity
RTS Scores	9.5	0.67	0.95

Source: Primary Data (2019)

Based on table 4, the cut-off point value of the RTS score was obtained at score of 9.5 with sensitivity value of 0.67 and specificity of 0.95. Sensitivity value of 0.67 shown clinically the ability of RTS in producing positive value or impairment in head injury with percentage of 67%. The specificity value of 0.95 shown clinically ability of RTS in producing negative value or no impairment in head injury with percentage of 95%.

Discussion

The results of this study indicated that RTS was a good predictor in predicting impairment in head injury patients in emergency room of General Hospital of dr. Slamet Martodirdjo Pamekasan with the value of AUC=0.851. The results of this study indicated that the

cut off point value of RTS was 9.5 with sensitivity value of 0.67 which explained positive value or impairment of head injury with percentage of 67% and specificity of 0.95 indicating clinically the ability of RTS to produce negative values or no impairment in head injury with percentage of 95%. This study was in line with research conducted by Manoochehry et al (2019) which stated that RTS was scoring system that could predict patient impairment and death in trauma cases including head injury [18].

RTS was trauma scoring first developed by Champion HR et al in 1989 that was widely used as a reference for trauma scoring [14,16]. Variable RTS also used in Trauma Related Injury Severity Score (TRISS), which was one of trauma scoring with anatomical and physiological systems [19]. RTS component consisted of GCS score, respiratory rate and systolic blood pressure [16]. Scoring of this RTS trauma had a weakness in its calculations which was quite complicated and respiratory rate component of RTS had little impact significance because it was influenced by other factors such as patient age, mechanism of injury and mechanical ventilation [20]. However, RTS was still widely used and well enough to predict the outcome of patients with trauma[17].

The advantages of using RTS trauma scoring, namely the RTS trauma scoring system had simple parameters, this system could be generalized, more accurate, the calculation was easy to use both in pre-hospital and hospital conditions (when the patient get in to emergency room) and had the ability to predict equal mortality even better from other scoring trauma systems so that it could facilitate hospital or other health agencies in making decisions for the implementation of patients[17].

RTS had a component in the form of GCS, systolic blood pressure and respiration. GCS was one of the predictors that might affect the impairment of patients with head injuries. According to Rahmani et al (2017) stated that GCS components greatly affect the outcome and mortality in patients with head injury [21]. Research conducted by Josep et al (2015) stated that head injury patients with GCS scoring 13-15 and get intracranial injury such as a fracture of the skull that accompanied intracranial hemorrhage patients was not a barrier for immediate action in the form of neurosurgery. Patients with fractures of the skull bones had ten times greater risk of experiencing neurological deficit and the worse the outcome obtained if the condition was not treated immediately or intervention by a team of neurosurgery. Therefore, GCS was a scale that was very important to assess awareness, clinical status and prognosis of patients with head injury [22].

Research conducted by Kung et al (2011) stated the level of awareness and improvement of the clinical condition after head injury in patients with GCS score of> 10 were more influenced by the value of the verbal component of the GCS score. However, head injury patients with score of 3-7, had the level of awareness and improvement of the clinical condition that was more influenced by the value of the motoric component of the GCS[15].

Another component of RTS that affected the impairment of head injury patients was systolic blood pressure. Systolic blood pressure was one of the predictors that might affect the impairment of patients with head injuries. Zafar et al (2011) stated that the systolic blood pressure in the emergency room was very related to the impairment and death of the patient. The risk of dying patients could be seen the value of systolic blood pressure <90 mmHg and> 160 mmHg [23].

Another component of RTS that affected the impairment of head injury was respiration. Respiration was one predictor of exacerbations and mortality in patients with head injuries. Head injury patients with hyperventilation might impair patient outcomes. The occurrence of hyperventilation was caused by a problem in intracranial due to impact or penetration in head injury patients thus causing increased intracranial pressure. Hyperventilation could decrease arterial partial pressure of carbon dioxide resulting in vasoconstriction, decreased cerebral blood flow and increased intracranial pressure [24].

However, the RR component of the RTS had reliable results which was low compared with GCS (0.9368) and systolic blood pressure (0.7326) in predicting the number of life of patients with severe head injury. Factors could affect the breathing of patients with head injury were age, mechanism of injury and the use of mechanical ventilation[20]. Based on the above, the RTS with component of GCS, systolic blood pressure and respiration rate could predict the impairment in patients with head injury.

Conclusion

RTS could predict impairment of head injury patients. RTS with three components to facilitate

the assessment of medical staff in hospital to conduct screening on patients at risk of impairment. Suggestions for further research, should use more sample and prospective method.

Conflict of Interest: None

Ethical Clearance: This study has passed the ethical test held at General Hospital of dr. Slamet Martodirdjo Pemakasan with no 070/218/432.603/2019

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The Relationship between Obesity and Fasting Blood Glucose Levels in High School Teachers

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Abstract

The prevalence of chronic and non-communicable diseases worldwide sharply increasing as an alarming rate including obesity and high level of glucose on blood which can lead to diabetes. The study aimed to look at the relationship between obesity and fasting blood glucose levels. The study was a cross sectional studies involving 57 teachers in Senior High School 5 Palu. The obesity was measure by BMI and glucose level was measured with Gluco Test. The study found a relationship between obesity and glucose level with $\rho = 0.000$.

Keywords: *Obesity, Hyperglycemia, glucose blood level, teahers.*

Introduction

The prevalence of chronic and non-communicable diseases worldwide sharply increasing as an alarming rate including obesity and high level of glucose on blood which can lead to diabetes.[1]Obesity has been subjected as a leading public health problem worldwide.[2] Obesity is one of risk factors of many diseases including Type-2 diabetes, insulin resistance, [3,4] cardiovascular diseases, hypertension, hyperlipidemia, musculoskeletal overloads, chronic renal disease, heart failure and cancers.[5–8] Obesity occurs because of an imbalance between energy intake and energy output (energy expenditures) so that excess energy occurs and stored in the form of fat tissue. This excess energy can be caused by high energy intake or low energy output. The cause of obesity involves several factors such as genetic, lifestyle and psychological.[9] The prevalence of obesity remains increasing in both developing and developed countries. This condition is followed by a high risk of increasing glucose levels on the blood or diabetes particularly type-2 diabetes. In the last 20 decade, the numbers of obesity have tripled in low-income countries which have imitated western life style.[1,8] In 2016, about 1.9 billion people aged 18 years and above were overweight and 650 million were obese.[10]

High fat concentration on human body can cause insulin retention and impaired glucose tolerance and certainly affect blood glucose levels. Blood glucose is a health term that refers to the glucose content in the bloodstream in the body, so it is at risk of pre-diabetes. Meanwhile pre-diabetes is a condition where blood sugar levels are higher than normal (normal blood glucose is 100-125 mg/dL, but not enough to diagnose diabetes but it can lead to diabetes when not handled properly.[1,9,11] Both obesity and diabetes is highly related to eating behavior. Palu is well known with its spicy and high fat food particularly its traditional foods.

Methodology

The study is an observational analytic study with a cross sectional study. This cross sectional study aimed to analyze the relationship between obesity to blood glucose levels among teachers of High School 5 (SMA 5) Palu City, Indonesia. The study applied total sampling to 57 teachers in the school were involved in the study. The data collected on November 2016 in

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SMA 5 Palu during the school time. In prior to the data collection, we managed legal permission in the study location than conducted primarily induction of the study to all teachers. In the primarily induction, we gave the informed concern to participants for those agreed to participate in the study, we then asked them to fasting (min 8 hours) in the data collection day. The obesity was obtained by measuring Body Mass Index (BMI) using height gauge (Microtoise Statumeter) for body height and Weight Gauge for measuring body height. Additionally, blood glucose level was measured with using Gluco Test. Chi-square test was applied to look at the correlation between obesity and glucose level with 95% of confidentiality ($\alpha = 0.05$).

Results

a. Sample Distribution by Gender

Table 1. Sample Distribution by Gender

Gender	Frequency	Percentage (%)
Male	25	43.9
Female	32	56.1
Total	57	100

Resource: Primary Data. 2016

Table 1 showed the total participants based on their gender. There were 57 teachers participated in the study; 25 (43.8%) male and 22 (56.2%).

b. Distribution of BMI (Body Mass Index)

Table 2. BMI (Body Mass Index)

Variables	Obesity		Normal	
	N	(%)	N	(%)
Sex				
Male	5	31.25	20	48.7
Female	11	68.75	21	51.3
Total	**16**	**100**	**41**	**100**
Age Group (Year)				
26-35	1	6.25	6	14.6
36-45	4	25	20	48.8
46-55	10	62.5	15	36.6
56-65	1	6.25	0	0
Total	**16**	**100**	**41**	**100**

Resource: Primary Data. 2016

The study found that there were 16 (28.1%) obese teachers and 41 (71.90%) non-obese teachers involved in the study. The highest incidence of obesity was experienced by teachers aged 46-55 years old (62.5%) and followed by teachers aged 36-45 years old (25%).

c. Distribution of Blood Glucose Level

Table 3. Distribution of Blood Glucose Levels

Variables	High (Hyperglycemia)		Normal	
	N	(%)	N	(%)
Sex				
Male	8	47	17	42.5
Female	9	53	23	57.5
Total	**17**	**100**	**40**	**100**
Age Group (Year)				
26-35	0	0	7	17.5
36-45	5	29.4	19	47.5
46-55	11	64.7	14	54
56-65	1	5.9	0	0
Total	**17**	**100**	**40**	**100**

Resource: Primary Data. 2016

17 participants of the study suffered high blood glucose levels (hyperglycemia), 47% and 53% were male and female respectively. 64.6% happened among teachers aged 46-55 years old and followed by teachers aged 36-45 years old (29.4%).

d. The correlation Between Obesity and Levels of Blood Glucose

Table 4. The Correlation between Obesity and Levels of Blood Glucose

BMI	Blood glucose level				p Value	Phi Cremmer	Risk Ratio
	High (Hyperglycemia)		Normal				
	N	%	N	%			
Obesity	13	76.5	3	7.5	0,000	0,702	8,3
Non Obesity	4	23.5	37	92.5			
Total	17	100	40	100			

Resource: Primary Data 2016

Table 4 above shows that teachers with obesity are more likely to suffer from hyperglycemia (76.5%) compared to non obese teachers (23.5%). This is also supported by the results of the Chi-Square test where the value of ρ <α is = 0,000 which shows a relationship between obesity and hyperglycemia. Furthermore, to find out the strength of the relationship between the two variables, the Phi test is performed, from the statistical results found the Phi value of 0.702 and is in the range 0.501 to 0.750. This means that obesity has a strong relationship with blood glucose levels. Based on the results of this study there was a 8.3 risk ratio, so obese people were 8.3 times more likely to experience an increase in blood glucose levels compared to people who were not obese.

Discussions

The chi-square correlation test found that there was a relationship between obesity and high blood glucose levels (hyperglycemia). This is based on the value of p <value α which is p = 0,000. A similar result was obtained by Noviara which states that there is a relationship between obesity and increased blood sugar levels. Obesity is a predisposing factor for the rise of blood sugar levels, this is due to several things, namely, beta cells of the island of Langerhans become less sensitive to stimuli or due to rising sugar levels and obesity will also reduce the amount of insulin receptors in cells throughout the body.(12)

According to Septa, the condition of obesity is influenced by the imbalance of excess energy intake rather than the excretion and lack of physical activity. Fat accumulation in fat cells resulting in fat cell hypertrophy (adipocytes) is the process of obesity begins. When adipocytes reach a certain level, there will be stimulation of the formation of new fat cells from the fat cells preadipocytes so that there is addition or hyperplasia and adjacent fat cells undergo hypertrophy. In adults it is proven that fat cell hypertrophy will cause increased inflammatory mediators such as IL-6 and TNF-α which are thought to inhibit phosphorylation of IRS-1 (insulin substrate receptor), so that the mechanism of action of insulin is disrupted and will cause insulin resistance.(13)

The primary research shows that time insulin resistance factors began to be dominant as a cause of hyperglycemia and various tissue damage. The high level of insulin resistance at this stage can also be seen from the increase in fasting blood glucose levels. This is in line with what happens in liver tissue, the higher the level of insulin resistance, the lower the inhibitory capacity of the glycogenolysis and gluconeogenesis processes, and the higher the level of glucose production from the liver. Hyperglycemia that occurs in disorders of glucose metabolism due to impaired insulin performance (deficiency and resistance), then gives various effects of metabolism and other tissue damage directly or indirectly.(14)

Disorders of the mechanism of action of insulin can cause obstacles in glucose utilization and increase in blood glucose levels. This will cause glucose to remain only in the blood so that blood glucose levels increase. Clinically, the disorder is known as diabetes mellitus. (14) An increase in mRNA Lipopolysaccharides (LPS) -induced TNF-α factor (LITAF) and protein levels along with increased BMI indicate a parallel relationship between LITAF and metabolic disorders. According to the study, LITAF is activated in obese patients and contributes to the development of obesity which induces inflammation and insulin resistance, based on the fact that LITAF plays a role in the inflammatory process in regulating the expression of TNF-α, IL-6 and MCP-1 which results in insulin resistance, and TLR4, one of the LITAF receptors in macrophages can also be stimulated by free fatty acids, which can cause an inflammatory process in obese patients.(15)

Lipopolysaccharides (LPS) -induced TNF-α factor (LITAF) is a TNF-α description regulator, which should play a role in the immune mechanism against infection. The LITAF gene is significantly present in the lymph, lymph nodes, and peripheral blood leukocytes. TNF-α is a powerful trigger for proinflammatory adipocytokinin such as IL-6, MCP-1, leptin and PAI-1, and it is very involved in the inflammatory process in obese patients. The increase in TNF-α observed in the fatty tissue of obese patients shows a direct relationship to the emergence of insulin resistance in obese patients. Insulin binds and acts primarily through insulin receptors, as well as receptor insulinlike growth factor-1 (IGF-1). Cellular insulin action has a variable effect on the post-reseptor pathway in target cells.(16)

According to Lee et al. (2007), obesity is the most common cause of insulin resistance associated with a decrease in the number of receptors and failure of post-receptors to activate tyrosine kinase which is a subunit b of insulin receptors activated when insulin binds to subunits a. Activation of this complex will

activate autophosphorylase and insulin-mediated action to control blood sugar levels. Failure to deliver signals to regulate blood sugar levels causes interference with blood glucose levels.[16–18]

Weight loss has a beneficial effect on comorbid obesity. Even a weight loss of 5 to 10 percent of the initial weight can result in significant health improvements. Although no retrospective studies have shown changes in mortality rates with weight loss in obese patients, with weight loss, a reduction in these risk factors is thought to reduce the development of type 2 diabetes and cardiovascular disease. There is strong evidence that weight loss in obese individuals and overweight reduces risk factors for diabetes and cardiovascular disease. Other strong evidence also shows that weight loss can reduce blood pressure in overweight normotensive individuals and hypertension; reduce serum triglycerides and increase HDL-cholesterol and generally result in a reduction in total serum cholesterol and LDL cholesterol. Weight loss can also reduce blood glucose levels in overweight and obese individuals without diabetes; and also reduce blood glucose levels and HbA1c in some patients with type 2 diabetes.[19]

Conclusions

A strong correlation between obesity and high level of blood glucose among teacher in Senior High School 5 Palu. 16 teachers suffered obesity and 13 of them were hyperglycemia with $\rho = 0.000$ or $\rho \leq 0.05$.

Conflict of Interest: I declare that there is no conflict of interest related to the study.

Ethical Clearance: The study has been approved by Ethical Commission of Faculty of Medicine, Universitas Tadulako, No. 1107/UN 28.1.30/KL/2016.

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A Case Study of the Health Adaptation of Former Schizophrenics in Communicating with the Bugis Makassar Community in the South Sulawesi Province

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Abstract

Objective: This study aims to identify and categorize the cases of health adaptation of former schizophrenic patients in the process of interaction and communication with the community after experiencing a healing phase.

Method: This research uses a qualitative method with the type of case study. The technique of determining informants using non probability sampling is purposive sampling intentionally characterizing former schizophrenics who have interacted and communicated directly with the internal and external environment. Field data collection techniques through primary data, such as participant observation and in-depth interviews with former schizophrenics. The informants selected and analyzed were nine cases of former sufferers who, on average, were aged 34 to 60 years. *Results*. This study found a categorization of health adaptation cases of former schizophrenics who had been cured medically and had initial interactions with the internal and external environment. Based on the analysis of health adaptation cases, four phases are categorized, namely: the healing phase, the interaction phase, the acceptance phase, and the openness phase. After going through these four phases, it was found a pattern of health adaptation of former schizophrenic patients in interacting and communicating with the Bugis-Makassar community. First, the manifest pattern is the ability of former schizophrenics to deal with and overcome internal and external environmental problems. The manifest pattern is characterized by positive self concepts and self disclosure is increasingly open. Second, latent patterns indicate the inability of former schizophrenics to overcome problems in the external environment. This gives rise to negative self concepts and closed self disclosure to communicate with the Bugis-Makassar community. *Conclusions.* Based on an analysis of nine cases of health adaptation of former schizophrenic patients in communicating with the Bugis-Makassar community, it was more dominant in the latent pattern than the manifest pattern. This is due to the higher openness in the internal environment compared to the external environment due to the shame of 'siri' in themselves and the nuclear family. As a result, fear arises when their families who are former schizophrenics suffer from lack or are not accepted in the Bugis-Makassar community.

Keywords: *Health Adaptation, former schizophrenics, Communication, Bugis Makassar.*

Introduction

Schizophrenia is a mental picture due to disharmony in the thought process, feelings and actions so that it affects social behavior. Schizophrenia is a schizophrenic reaction suffered by individuals and is regressive to avoid tension and anxiety in the self so as to cause delusions and hallucinations.[1] In the Bugis-Makassar community, the type of schizophrenia is still considered a psychiatric disease that although it has been declared medically cured from a doctor, people's perceptions of this disease still cause negative stigma. As a result, the nuclear family and community have a fear of schizophrenia.[1,2]

A very interesting factor is that South Sulawesi is in third place with a prevalence of 0.26% after Yogyakarta

on Java and Aceh on Sumatra. Data of the South Sulawesi Special Region Hospital indicates that the data for schizophrenia patients tends to increase every year. This increase was shown by patients from the Toraja area. Medical record data of South Sulawesi Province Special Region Hospital in 2016 of 348 patients recovered with an initial diagnosis of a rage with 240 patients and anxious 108 patients.

Schizophrenia is an interesting phenomenon in South Sulawesi, where the majority of the population is ethnic Bugis-Makassar. Streotype factors and personal prejudice against schizophrenia cause the Bugis-Makassar community to tackle this type of disease through non-medical treatment, such as traditional healers and even 'inclusion'. The term shaman or 'sanro' in the Bugis-Makassar community, is a person who is an expert in treating diseases traditionally.[5,6.8]

The specification of the focus of this research is to find, categorize the process of interaction of health adaptation carried out by former Schizophrenic patients in communicating with the Bugis-Makassar community.

Method

Research Location: The health adaptation case study of a former schizophrenic sufferer in communicating with the Bugis-Makassar community is located in South Sulawesi, namely; Parepare City, Makassar City and Wajo District..

Types and Sources of Data: This type of research uses qualitative method referring to case studies. The aim is to reveal the health adaptation process of former Schizophrenia sufferers in communicating with the Bugis-Makassar community. The technique for determining informants through non probability sampling is purposive sampling based on the terms and objectives of the study. The informant's requirements are first, a former schizophrenic who has interacted directly with the community at least 3 months after being medically recovered from a doctor. Second, former schizophrenics who are willing to analyze their cases sequentially and in detail. Informant cases are based on research data sources, namely direct observation of social life. Indepth interview techniques by collecting individual narratives of former schizophrenics based on medical records, recover, interact and communicate with their environment. This technique can explore deeply the lives of former schizophrenics before and after recovery.

Data Collection Techniques: In analyzing the identification and categorization data of health adaptation cases of former schizophrenic patients in the process of communication and interaction is done through the analysis of Miles.[12] The steps of Huberman's analysis in qualitative research are: data condensation steps (data condensation), presenting data (data display), and conclusion drawing and verification. Data condensation refers to the process of selecting, focusing, simplifying, abstracting, and transforming.

Results

Humans are social creatures who need direct interaction and communication with their environment. The need to communicate with other individuals, such as family, and peers is a basic need that must be met. Former schizophrenics are individuals who need a process of direct interaction and communication with the internal and external environment. Human psychological needs to communicate and need other people in social life.

Research informants are former schizophrenics who have been medically recovered from mental disorders due to physical, psychological and socio-cultural changes. Schizophrenics have a negative stigma in the views of some Bugis-Makassar people. Public perception assumes that Schizophrenia is a curse that must be avoided. As a result, people tend to keep their distance and direct contact with them. This is due to the myth of schizophrenia which is considered a "crazy" disease in which individuals experience hallucinations, illogical thoughts, cause aggressive behavior, and often scream hysterically. Even schizophrenics lose their ability to think, hallucinating causing them to be seen talking to certain objects that are not in front of them.

The results of tracing the case were carried out in three locations in South Sulawesi Province, namely Makassar City, Parepare City and Wajo Regency. In tracking down informants who were willing and open to be observed and interviewed on an ongoing basis found only nine people. This factor is caused by the closure of former schizophrenics when first interacting with the external environment. Shame or known as 'siri' in the Bugis-Makassar community is a barrier to the openness of the causes of the illness. The findings of informant characteristics based on the medical records of former schizophrenics can be seen in the following Table 1:

Table 1. Medical Records of Former Schizophrenics

Informant Number	Informant Former Schizophrenic Patient	Age (Years)	Gender	First Age Category Suffering from Schizophrenia (Years)	Age of Medical Treatment Period (Years)	Alternative Early Treatment
1.	Andi	60	Male	35	37	Shaman
2.	Lia	45	Female	37	37	Medical
3.	Baso	40	Male	30	31	Shaman
4.	Arlina	43	Female	22	22	Medical
5.	Adi	45	Male	21	26	Shaman
6.	Rafi	48	Male	33	33	Medical
7.	Elia	40	Female	35	35	Medical
8.	Ahmad	34	Male	22	29	Shaman
9.	Dani	50	Male	42	42	Medical

Source: Primary Data, 2019.

The data in Table 1, indicates that the informants of former schizophrenic patients had an average age of 40-45 years of age of 5 people. Age 46-60 years as many as 3 people and only 1 person aged 34 years. This condition is different from the results of Dindia's research (2000b: 24) which found women to be more open than men. Dindia found cases that women were more open about expressing themselves to women than men to women; or women are more open about expressing themselves to men than men to women. Then, an analysis of 205 studies assessed gender differences in self disclosure.) find women more open than men.[14] That when women told stories with their friends, they usually involved emotional feelings in expressing themselves.[15]

Analysis of the patient's medical record when first experiencing initial symptoms tends to choose the hospital or medical treatment as many as 5 cases. There were 4 cases that used medical treatment or traditional medicine for 1 to 4 years. Pure schizophrenia is a medical disease that has the potential to affect everyone.

Health Adaptation Phase Process of Former Schizophrenic Patients in Communicating with the Bugis-Makassar Society: The case of health adaptation of former schizophrenics starts with self-concept as a mirror for the individual in seeing himself. Individuals will react to the environment according to their own self-concept. The phase is the healing phase, the interaction phase, the acceptance phase, the openness phase. The characteristics and characteristics of the four phases can be seen in Table 2 below:

Table 2. Health Adaptation Phase Former Schizophrenic Patients

Early Phase of Healing	Interaction Phase	Acceptance Phase	Openness Phase
Passive: Individuals choose to remain silent and less interact and communicate with the external environment.	**Internal:** Individuals tend to be open and interact with nuclear families.	**Reception:** Individuals are personally accepted by the external environment.	**Closed:** Individuals have gone through the process of healing, interaction, acceptance, but still closing themselves with the external environment.
Active: Individuals are active and have their own initiative to open and interact, communicate with the external environment.	**External:** Individuals tend to be closed or silent when interacting with the community in their environment	**Rejection:** Individuals are personally denied the external environment.	**Open:** Individuals have gone through the process of healing, interaction, acceptance, but still closing themselves with the external environment.

Source: Primary Data, 2019

Based on the findings and categorization of health adaptation cases of former schizophrenics in four phases: First, the healing phase. In this phase, former passive schizophrenics remain silent, lack of interaction and communication with the external environment. Passivity is caused by feelings of 'siri' shame in the self so that it affects the negative self concept that is owned. That one's self-concept is oriented towards positive self-concept and negative self concept.[16,17] Former schizophrenics in the passive phase are in the category of negative self-concept. The behavioral characteristics of former schizophrenics consider themselves helpless, diseased and afraid of being ostracized in society.

Second, the interaction phase. This phase is marked by the motivation of former schizophrenics to interact and communicate with the internal and external environment.

Third, the acceptance phase. This phase is marked by the feeling of being accepted or rejected by the Bugis-Makassar people who still believe the myths of the history of schizophrenia.

Fourth, the openness phase. This phase category is characterized after the individual goes through a process of healing, interaction, acceptance. Although, the internal and external environment has been open to receiving former schizophrenics, there are still some who remain closed, especially in the external environment.

Pattern of Health Adaptation Former Schizophrenic Patients in Communicating with the Bugis-Makassar Society: Health adaptation is a way for former schizophrenics to adapt themselves to the internal and external environment to communicate with the Bugis-Makassar community. Based on the analysis of nine cases found two patterns of health adaptation of former schizophrenics communicating with the Bugis-Makassar community, namely the manifest pattern and the latent pattern. The manifest pattern is openness and positive self acceptance..

Furthermore, the latent pattern is marked by the closure of former schizophrenics who do not interact with the Bugis-Makassar community. The reason is that former schizophrenics fear the risk of resistance from the surrounding community. Former schizophrenics prefer to stay at home or do homework activities. Factors of self confidence and embarrassment 'siri' cause them to choose to close themselves with the surrounding environment. Former schizophrenics perceive that mental illness suffered will never be completely healed and must continue to take medication for life. Medical control through drugs makes former schizophrenics feel that the illness can recur. Finally, they have a negative self concept that tends to live in fear and not trust others too much. Based on tracing the cases of former schizophrenics, there were two patterns of health adaptation of former schizophrenics in communicating with the Bugis-Makassar community, as shown in the following Table 3:

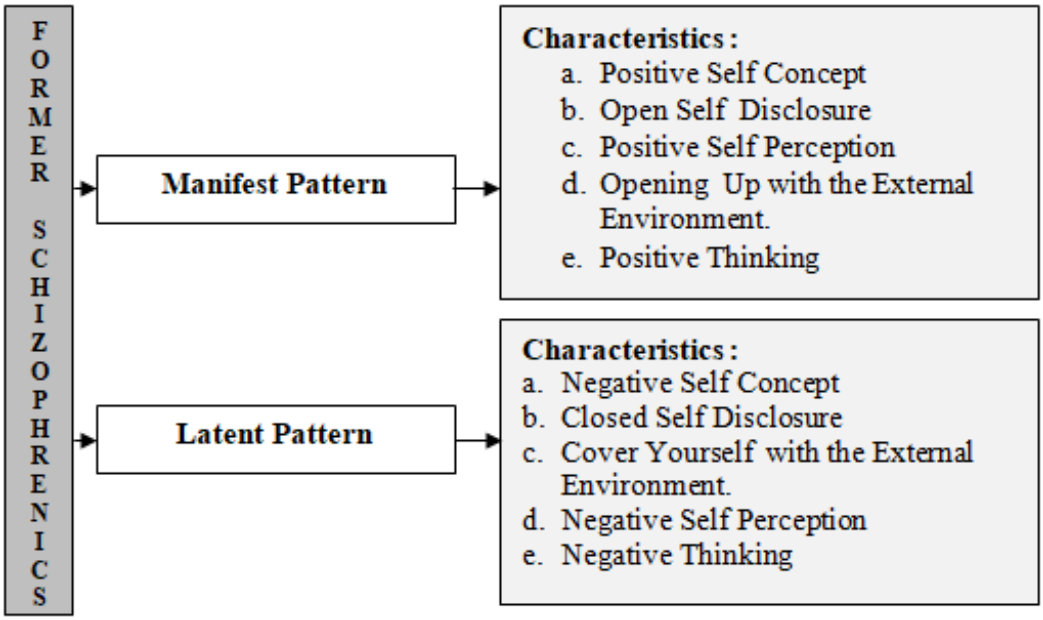
Table 3. Pattern of Health Adaptation Former Schizophrenic Patients

Informant Former Schizophrenic Patient	Pattern of Health Adaptation	Former Schizophrenic Patient
	Manifest Pattern	Latent Pattern
Andi	√	
Lia		√
Baso		√
Arlina		√
Adi		√
Rafi	√	
Elia		√
Ahmad		√
Dani	√	√

Source: Primary Data, 2019

The results found that the pattern of health adaptation cases of former schizophrenics in communicating with the Bugis-Makassar community was more dominant than the latent pattern of manifest patterns. Latent patterns indicate an inability to overcome the problems of self concept and self disclosure in former schizophrenics.

There are only three informants in the manifest pattern category who are able to face and overcome problems to interact and communicate with the internal and external environment former schizophrenics who are in the manifest pattern have had positive concepts and increasingly open self disclosure, such as, Table 4 follows:



Source: Primary Data, 2019

Figure 1. Characteristics of Health Adaptation Patterns of Former Schizophrenic Patients

In the case of former schizophrenics, community acceptance factors become a variable that can cause them to be in manifest or latent patterns. That is, the more positive acceptance of the internal and external environment of former schizophrenics, the more positive self concept and self disclosure they have. Positive self concept can lead to more effective individual interpersonal abilities, intellectual abilities and environmental mastery. The concept of self is not innate but rather through a process of learning and experience of interaction with others. Self concept is a life cycle that can change the mindset, positive outlook, culture, and socialization with the environment. For example, nuclear family, peers, and the community.

Conclusions

This study found the categorization of health adaptation cases of former schizophrenic patients in four phases, namely: the healing phase, the interaction phase, the acceptance phase, and the openness phase. The phase process of the former schizophrenic patient is a different health adaptation for each individual in interacting and communicating with the Bugis-Makassar community. The manifest pattern has the characteristics of a positive self concept and self disclosure is increasingly open. Latent patterns are characterized by negative self concepts and closed self disclosure to communicate with the Bugis-Makassar community. The results show that the health adaptation of former schizophrenics is more dominant in the latent pattern than the manifest pattern. The condition is caused by self concepts and self disclosure of former schizophrenics, nuclear family, and the perception of acceptance of the Bugis-Makassar community.

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Risk Factors Associated with HIV Infection among Male to Transvestites in Five Cities in Indonesia in 2015

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Abstract

Transgender people are 49 times more likely to live with HIV than common people. In 2015 HIV prevalence in Indonesia increased from 2011. This study aims to determine the risk factors associated with HIV infection in transvestites. This study used a cross-sectional design, using data from the Indonesian Ministry of Health's Integrated Biological and Behavior Survey in 2015, the study population was all transvestites in five cities in Indonesia, the sample was someone who was biologically male but behaved like a woman, aged ≥15 years interviewed and have complete data. We investigate risk factors associated with HIV infection. Data analysis used the SPSS application, for p-value statistical tests <0.05 were considered statistically significant. Results: 64% of transvestites aged over 30 years, 57% had low education, 67% of transvestites had anal sex in the past week, 86% of transvestites used condoms during sex, the results of multivariate analysis showed that factors associated with HIV infection were having sex with male client at last week (OR=1.60, 95% CI: 1.04-2.45); age ≥30 years (OR=1.61, 95% CI: 1.10-2.38) and had a history of symptoms of STIs in the last year (OR=1.88, 95% CI: 1.24-2.85). Risk factors associated with HIV infection among transvestites in five cities in Indonesia are having anal sex with male client in the past week; Age ≥30 years; and have a history of symptoms of STIs in the past year.

Keywords: *Risk Factors, HIV Infection, transvestites, Indonesia.*

Introduction

HIV/AIDS is an infectious disease that is still a major health challenge worldwide. Since the beginning of the epidemic, more than 70 million people have been infected with the HIV virus and around 35 million people have died from HIV. Globally, 36.9 million (31.1-43.9 million) people were living with HIV at the end of 2017. An estimated 0.8% (0.6-0.9%) of adults aged 15-49 years worldwide living with HIV, although the burden of the epidemic varies greatly between countries and regions.[1]

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In 2016, Indonesia had 48,000 (43,000-52,000) new HIV infections and 38,000 (34,000-43,000) AIDS-related deaths. There were 620,000 (530,000-730,000) people living with HIV in 2016. The key populations most affected by HIV in Indonesia are: Sex workers, with an HIV prevalence of 5.3%. Gay men and other men who have sex with men, with an HIV prevalence of 25.8%. People who inject drugs, with an HIV prevalence of 28.76%. Transvestites, with an HIV prevalence of 24.8%.[2]

Transvestites were one of the groups most affected by the HIV epidemic and 49 times more likely to live with HIV than the general population.[3] HIV prevalence among Transvestites was higher than male transgender.[4] STBP data from the Indonesian Ministry of Health shows that from 2007 to 2015 HIV prevalence among transgender women had fluctuated, from 24% in 2007 to 22% in 2011 and increasing again to 24.83% in 2015.[5-7]

Social, economic and legal exclusion, working as

sex sellers, risky sexual behavior and injecting hormones put transvestites into vulnerable individuals infected with HIV.[8] Various studies from around the world have described the increase in sexual risk behavior among Transvestites. Transvestiteswho have sex with men were more likely to take receptive roles during anal sex than men who have sex with men (MSM), use fewer condoms, and have a higher number of sexual partners.[9-12]

Transvestites individuals throughout the world face very high stigma and discrimination, lack of social and legal recognition of their gender, and exclusion from employment and education opportunities.[13,14] For many Transvestites, sex with men can provide important validation about their gender identity.[15-17] This study aims to determine the risk factors associated with HIV infection among transvestites.

Method

This study uses a cross-sectional design using secondary data from the Indonesian Ministry of Health's Integrated Biological and Behavioral Survey (IBBS) conducted in March-June 2015 in 5 cities in Indonesia, namely DKI Jakarta, Bandung, Semarang, Surabaya and Malang. IBBS is a continuous survey, started in 2007, by taking behavioral data and biological measurements together using questionnaires and blood tests. The survey collects information data on transvestites using multistage random sampling, the first stage is to select survey location samples according to the sample framework that has been made. The choice of Probability Proportional to Size (PPS) sample location, with 'Size' is the number of populations in each location. The second stage is to select samples (respondents) who meet the requirements in each selected location. Sampling is done randomly or directly in accordance with those found.[5,7,18] The sample framework for transvestites is a list of locations for transvestites, both sex workers and those working in salons, which are equipped with estimates of the number of Transvestites populations in each location, information on key people who can be contacted at each location, both names and telephone or mobile, and information about the exact visit time for the interview. The data of the Transvestites were obtained from the results of field inventory and tracking at the time of registration of the sampling location based on the transvestites key population.

The population of this study is transvestites. Transvestites included in the survey are not only transvestites who offer sex but all transvestites including transvestites who work in salons. While the sample is someone who is biologically male who is 15 years of age or older and has lived in a survey city for at least one month, and is recognized by friends of profession, "mami", or NGO workers as a transvestite. The number of samples obtained was 1,003 respondents, 8 respondents refused to do a biological examination, thus the number of samples to be analyzed was 995 respondents.

We investigate the factors associated with HIV infection in Indonesia, we include demographic and behavioral factors. We categorize the level of education completed by respondents to low and high education levels, age is categorized as less than 30 years and more than 30 years, the age of first time having sex is categorized as less than 15 years and more than 15 years. We included sexual behavior such as condom use during sex in the yes and no categories, use of lubricants during sex with no and no, history of selling sex in the yes and no categories, having anal sex in the past week in the yes and no categories. We also include information on the number of different customers served in the past week in the category of 0-1 people and more than 2 people. Besides that, we also included a history of STI symptoms (sores around the genitals and anus, warts around the genitals and anus, fluid coming out of the genitals and anus, pain when urinating and lumps around the anus) in the last year in the yes and no categories. For biological information, HIV status measured by rapid test and Syphilis status was carried out by rapid RPR and TPHA blood tests. Data analysis in this study was conducted to look at the risk factors for the incidence of HIV infection using logistic regression tests with a 95% confidence level. Data analysis was performed using SPSS version 16.0.

Results

In the 2015 Integrated Biological and Behavior Survey successfully interviewed 1003 respondents, 995 respondents were willing to take an HIV test with 24.83% of them HIV positive.

Table 1. Bivariate Analysis of Risk Factors Associated with HIV Infection among Transvestites in 5 cities in Indonesia 2015

Characteristics	HIV		Non HIV		OR	95% CI	P Value
	N	%	n	%			
Age (Years)							
≥30	171	26.8	467	73.2	1.35	1.00-1.84	0.053
<30	76	21.3	281	78.7			
Level of Education							
Low	137	24.4	425	75.6	0.94	0.71-1.26	0.695
High	110	25.5	322	74.5			
First Age of Having Sex Intercourse (years)							
<15	66	26.0	188	74.0	1.04	0.75-1.45	0.808
≥15	180	25.2	534	74.8			
Ever Selling Sex in the Last Year							
Yes	220	26.7	605	73.3	1.85	1.19-2.87	0.006
No	27	16.5	137	83.5			
Having Anal Sex with Male Clients in the Last Week							
Yes	137	30.4	314	69.6	1.38	0.96-2.00	0.084
No	53	24.0	168	76.0			
Number of Different Male Clients Who Served Anal Sex Last Week							
≥2people	133	29.6	317	70.4	1.27	0.86-1.86	0.226
0-1 people	48	24.9	145	75.1			
Using Condoms When Last Anal Sex with Male Clients							
No	21	22.6	72	77.4	1.40	0.84-2.36	0.199
Yes	169	29.0	413	71.0			
Using Lubricant When Last Anal Sex with Male Clients							
No	168	28.0	431	72.0	0.96	0.57-1.62	0.869
Yes	22	28.9	54	71.1			
Consistent Using Condoms When Last Anal Sex with Male Clients							
No	103	28.7	256	71.3	1.13	0.80-1.61	0.491
Yes	74	26.2	208	73.8			
Have a History of Condoms Breakage last month							
Yes	73	26.9	198	73.1	1.27	0.91-1.76	0.163
No	132	22.6	453	77.4			
Has a history of STIs symptoms last year							
Yes	70	34.8	131	65.2	1.86	1.33-2.60	0.000
No	177	22.3	615	77.7			
Syphilis Status							
Positive	55	31.8	118	68.2	1.53	1.05-2.22	0.020
Negative	122	26.3	341	73.7			

From the results of bivariate analysis obtained 8 (eight) variables that have a P value of less than 0.25 which will then be included in the multivariate model, namely: age variable with p-value=0.053; variable had sold sex last year with p-value=0.006; variable Sexual Anal with Male Customer Last Week with p-value=0.084; Variable Number of Different Male Customers Served by Anal Sex Last Week with p-value=0.226; variables Using Condoms When Last Anal Sex with Male Customers with p-value=0.199;

variable has a history of torn condoms in the last month with p-value=0.163; the variable has a history of STI symptoms last year with p-value=0.000; and syphilis status variables with p-value=0.020 (Table 1).

Table 2. Final Model of Multivariate Analysis of Risk Factors for HIV Infection among Transgender in 5 Cities in Indonesia in 2015

Risk Factor	B	Wald	P	OR	(95% CI)	
					Lower	Upper
Having Anal Sex with Male Clients in the Last Week	0.469	4.615	0.032	1.60	1.04	2.45
Age ≥ 30years old	0.476	5.749	0.017	1.61	1.10	2.38
Has a history of STIs symptoms last year	0.629	8.686	0.003	1.88	1.24	2.85

Of the eight variables with p-value <0.25 entered into multivariate analysis, after a likelihood test was obtained, only 3 (three) variables were entered into the final model of multivariate analysis, namely variable Having anal sex with male customers in the past week, age variable and history had history symptoms of STIs in the past year (Table 2).

Discussion

The 2015 IBBS survey among transvestites shows that HIV prevalence is still high. HIV prevalence among Transvestites increased in Indonesia from 21.82% in 2011 to 24.82% in 2015.[18,19] The results of this study illustrate that older age in transvestites and low levels of education are still high among Transvestites groups, this is similar to the results of previous studies conducted by Prabawanti et al.[20,21]

We found a significant association between having had a history of STI symptoms in the past year and the incidence of HIV infection. Transvestites who have had symptoms of STIs for the past year have a three times greater risk of HIV infection than those who have never experienced symptoms of STIs. The existence of warts around the genitals and/or anus indicates that a person suffers from a sexually transmitted infection (STI) condyloma acuminatum (veneral warts), a sexually transmitted infection caused by Human Papillomavirus (HVP), besides this virus can cause lesions in the cervix, vagina, urethra anus.[22] Together with the presence of syphilis infection, once had symptoms of STIs (sores/ sores around the genitals, wounds/sores around the anus, and lumps/swelling around the anus) can increase the risk of transmission of HIV infection because mucosal disorders in the form of anus lesions can facilitate HIV infection.[23]

In addition, having anal sex with male customers in the past week is also a risk factor for getting HIV. Anal sex is a high-risk sexual behavior for HIV transmission when compared to vaginal sex or oral sex. Most transvestites are receptive partners in every anal sex. Receptive anal sex is far more at risk for HIV.[24]

Age also has a very important role in the occurrence of HIV infection in transvestites. Older people are vulnerable to HIV infection due to the immune system in their bodies. Kalayjian et al 2003 revealed that the thymus gland is an important organ involved in the development of the human immune system and serves as the main location for maturing T lymphocytes.[25]

In addition to the three factors above, the occurrence of HIV infection in transvestites cannot be ignored from several other factors. When a transvestite becomes a sex worker, then she will automatically have sex with many different partners alternately. In many Transvestites populations in the world, on average transvestites work as sex workers. Low Socio-Economic level factor encourages transvestites to seek additional income by selling commercial sex services to some people, this will increase vulnerability to HIV infection. The findings of this study are the same as that of Fernandes et.al in Brazil reporting that 75.7% of Transvestites people sell sex.[26,27]

The use of condoms and lubricants and consistent use of condoms during sexual intercourse with male customers also play a role in the incidence of HIV infection in transvestites. The finding that a low proportion of transvestites who reported consistent condom use might be influenced by the role of their sex partners, arguing that the use of condoms could reduce pleasure during sex.[20,27]

The main limitation of the study is that this study may still have a selection bias because disease status can influence subject selection. Information bias is also likely to occur because the information extracted is retrospective based on memory and because respondents may not be fully honest in answering any sensitive questions related to risky behavior.

Conclusion

Risk factors associated with HIV infection among transvestites in five cities in Indonesia are 1) Having anal sex with male customers in the past week; 2) Age ≥30 years; and 3) Have a history of symptoms of STIs in the last year. The most dominant factor is having a history of STI symptoms in the past year.

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Shift Working Relationship with Blood Pressure in Excess Noise Workers Exposed NAB Spinning in the Department of the Winding Pt Star Asahi Textile Industry

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Abstract

Implementation of the system work in an industry has a system of shift work, where the work shift has consequences that need to be realized by each worker, The production process of the Department of Spinning Winding part PT Bintang Asahi Textile Industry has a system of shift work were divided into three shifts; morning shift (6:00 to 14:00), the day shift (14:00 to 10:00 p.m.) and the night shift (22:00 to 6:00). *Shift* Employers have a negative impact that can affect workers one of them in the form of physiological aspects of circadian rhythms, so it can affect an increase in blood pressure, This study aimed to analyze the relationship between blood pressure shifts with workers exposed to noise exceeding the NAV Department Spinning Winding part PT Bintang Asahi Textile Industry. This research uses a quantitative research design with cross sectional analytic. The population in this study is a part Spinning Winding Department worker with a sample 54 respondents taken with total sampling. Data analysis using Chi Square test. Statistical analysis showed no association with blood pressure shift workers exposed to noise exceeding the NAV Department Spinning Winding part PT Bintang Asahi Textile Industries ($p = 0.043$ and $p = 0.007$).

Keywords: *Shift Work, Blood Pressure.*

Introduction

Implementation of the system work in an industry has a system of shift work, where the work shift has consequences that should be realized by every worker, because of differences in working conditions between the morning shift, day and night. Shift work is defined as work at certain hours of the attempt by the company to maximize the productivity of labor[1]. Shift work does have advantages for workers, can do other activities such as morning and afternoon. However, shift work could increase the risk of health problems for workers due to work schedule that is not balanced, so that workers are more prone to health problems[2].

PT Bintang Asahi Textile Industry or abbreviated to PT BATI is a company engaged in textiles that have some departments. On the Winding, the process of changing spools of thread on the tube to form a cone (yarn shape ready for the market). Department Spinning Winding section has a number of employees by 54 workers and divided into 3 shifts; morning shift (6:00 to 14:00), the day shift (14:00 to 22:00) and night shift (22:00 to 6:00). Work environment for noise after preliminary measurements, it is known that the three points obtained by the average yield on the aircraft engine noise by 87.6 dBA (point 1), then in the middle of the machine of 88.5 dBA (point 2), and at the end of the machine at 86.8 dBA (point 3). The third point is the nearest area workers are doing the job. NAB workplace standards regarding noise should not exceed 85 dBA. The noise generated at the Ministry Spinning Winding section exceeds NAB is

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85 dBA, the working environment has a high noise can affect blood pressure[5].

According to research conducted by Anggraini (2017) results indicate p value of 0.000 <0.05 so that it can be concluded there is a relationship between blood pressure of shift work. Based on interviews to 15 workers on the morning shift, day and night average worker complained of excessive headaches, eye dizzy and feel tired.

Material and Method

This research uses a quantitative analytical research with cross sectional approach that is where the data related to the dependent variable or free (shift work) and independent or dependent (blood pressure) that will be collected and observed in the same time. This research was conducted on December 29, 2017. A study of shift work and blood pressure of workers conducted in the Polyclinic PT Bintang Asahi Textile Industry.

The population in this study were all employees of the Department of Spinning Winding part in PT. Save Asahi Textile Industry some 54 workers. The sampling technique used in this study is total sampling, where researchers use the subject of the population of the morning shift, day shift and the night shift. Data retrieval independent variables that shift work using a questionaire with informed consent form, then the dependent variable blood pressure using a tension meter Type digital OMRON HEM 7130. The data analysis is univariate and bivariate analysis.

a. **The Univariate Analysis:** The analysis is used to describe the characteristics of the studied variables, both dependent and independent variables. Analysis conducted to describe each of the variables that shift work and blood pressure. These data generate a frequency distribution and percentage of each variable.

b. **The Bivariate Analysis:** The analysis used to determine the relationship shifts with workers' blood pressure. The results of the statistical test Chi Square test. If the p value <0.05 then Ho is rejected and if the p value> 0.05 then Ho is accepted.

Findings:

a. Univariate Analysis

1. Environmental characteristics

Table 1. Measurement Method Department Spinning Winding part PT Bintang Asahi Textile Industry

Shift	Measuring point	Average Noise (dBA)
Morning	Point 1 (Parent)	88.90
	Point 2 (Central)	90.85
	Point 3 (End)	89.98
daylight	Point 1 (Parent)	89.99
	Point 2 (Central)	90.75
	Point 3 (End)	88.98
Night	Point 1 (Parent)	89.95
	Point 2 (Central)	89.97
	Point 3 (End)	89,90

Noise measurements carried out at three points with 10 measurements. On the morning shift at 07.00 is obtained an average yield of noise at the parent amounted to 88.90 dBA machine (point 1), in the central part of the engine of 90.85 dBA (point 2), and at the end of the machine by 89.98 dBA (point 3). Afternoon shift 13.00 average result of noise in the parent's share amounting to 89.99 dBA machine (point 1), in the central part of the engine of 90.75 dBA (point 2), and in the end amounted to 88.98 dBA machine (point 3). The night shift at 23:00 obtained an average yield of noise at the parent amounted to 89.95 dBA machine (point 1), in the central part of the engine of 89.97 dBA (point 2), and at the end of the machine at 89,90 dBA (point 3).

Table 2. Distribution Characteristics of Respondents In Labor Department Spinning Winding part PT Bintang Asahi Textile Industry

Characteristics of Respondents	Systolic Blood Pressure						Blood Pressure Diastole							
	Increase		Decline		Total		Increase		Decline		Permanent		Total	
	n	%	n	%	n	%	n	%	n	%	N	%	N	%
Age														
Early adulthood (26-35 years)	5	9.3	1	1.9	6	11.1	6	11.1	-	-	-	-	6	11.1
Adults final (36-45 years)	19	35.2	8	14.8	27	50	17	31.5	7	13	3	5.6	27	50
Elderly early (46-55 years)	15	27.8	3	5.6	18	33.3	16	29.6	2	3.7	-	-	18	33.3
Elderly end (56-65 years)	2	3.7	1	1.9	3	5.6	2	3.7	1	1.9	-	-	3	5.6

Characteristics of Respondents	Systolic Blood Pressure						Blood Pressure Diastole							
	Increase		Decline		Total		Increase		Decline		Permanent		Total	
	n	%	n	%	n	%	n	%	n	%	N	%	N	%
Years of service														
New (≤ 5 years)	6	11.1	3	5.6	9	16.7	7	13.0	1	1.9	1	1.9	9	16.7
Long (> 5 years)	35	64.8	10	18.5	45	83.3	34	66.7	9	16.7	2	3.7	45	83.3
Hypertension Disease History														
There is history Disease Hypertension	28	51.9	5	9.3	33	61.1	28	51.9	3	5.6	2	3.7	33	61.1
There is no History penyaki hypertension	13	24.1	8	14.8	21	38.9	13	24.1	7	14.8	1	1.9	21	38.9

The age of respondents most in the Department Spinning Winding section contained in the mature end of the 36-45 years category by 27 respondents (50.0%) with increased systolic blood pressure as much as 19 respondents (35.2%), while as many as 17 respondents (31, 5%) had an increase in diastolic blood pressure. Based on the working lives of most respondents in the Department Spinning Winding part is the old category (> 5 years) of 45 respondents (83.3%) with increased systolic blood pressure as much as 35 respondents (64.8%), while as many as 34 respondents (66, 7%) experienced an increase in diastolic blood pressure. Based on a history of hypertension, most respondents to the Department Spinning Winding section contained in the category of no history of hypertension by 33 respondents (61,1%)

2. Blood Pressure:

Table 3. Frequency and Percentage Distribution of Respondents by systolic and diastolic blood pressure Spinning Department Winding part PT Bintang Asahi Textile Industry

Shift	Systole		Diastole	
	Before	After	Before	After
Morning	115	118	60	70
	118	140	70	90
	115	118	60	60
	119	112	60	62
	112	115	60	70
	118	125	65	80
	119	160	65	100
	130	135	80	85
	110	113	60	65
	116	126	68	80
	111	136	66	85
	130	124	80	84
	114	118	69	70
	110	115	60	64
	158	162	90	110
	140	145	90	92
	118	164	70	100
	115	135	60	82
Average	**120,4**	**124,6**	**68,5**	**80,5**
Daylight	124	128	60	82
	110	130	84	80
	140	145	64	80
	118	127	90	90
	115	120	60	80
	124	110	60	80
	140	145	80	60
	114	125	90	94
	110	124	60	80
	120	160	60	84
	118	105	80	100
	106	160	60	60
	117	140	60	100
	110	118	60	90
	115	120	65	60
	140	165	60	80
	110	106	90	110
	118	143	60	92
Average	**119,3**	**131,7**	**69**	**83,4**
Night	137	128	60	92
	119	108	80	70
	115	128	70	60
	108	126	65	85
	119	150	60	80
	112	110	79	90

Shift	Systole		Diastole	
	Before	After	Before	After
	120	124	70	60
	113	164	80	84
	118	114	62	105
	110	113	65	60
	140	125	60	62
	114	160	90	84
	115	150	65	101
	129	115	60	92
	116	114	80	60
	118	116	68	65
	105	130	66	60
	120	125	60	83
Average	**118,2**	**127,8**	**68,9**	**77,4**

The results of measurements of systolic and diastolic blood pressure in 54 respondents indicated that the morning shift showed the average systolic blood pressure before work amounted to 120.4, while the systolic blood pressure after work an average of 124.6. Diastolic blood pressure before working an average of 68.5, while the average of 80.5 increased diastolic blood pressure after work.

On the day shift, the average systolic blood pressure before work amounted to 119.3, while the systolic blood pressure after work an average of 131.7. An average of 69 diastolic blood pressure before work, while an average of 83.4 increased diastolic blood pressure after work. On an average night shift demonstrated by 118.2 experienced systolic blood pressure before work, while an average of 127.8 experienced systolic blood pressure after work. An average of 68.9 diastolic blood pressure before work, while an average of 77.4 increased diastolic blood pressure after work.

b. Bivariate Analysis

Table 4. Relationship Test Results Shifts with systolic blood pressure Workers

Shift	Systolic Blood Pressure				p-value
	Increase		Decline		
	n	%	n	%	
Morning	16	29.6	2	3.7	0.043
Daylight	15	27.8	3	5.6	
Night	10	18.5	8	14.8	

Based on test results obtained using Chi Square test p-value = 0.043 <0.05, so it can be concluded that there is a relationship shifts with systolic blood pressure of workers.

Table 5. Test Results Relationship Shift Working with Blood Pressure diastole worker

Shift	Blood Pressure Diastole						p-value
	Increase		Decline		Perma Nent		
	n	%	n	%	n	%	
Morning	17	31.5	0	0	1	1.9	0.007
Daylight	14	25.9	2	3.7	2	3.7	
Night	10	18.5	8	14.8	0	0	

Based on Table 5. based on test results using test *Chi Square* obtained p-value = 0.007 <0.05, so it can be concluded that there is a relationship shifts with diastolic blood pressure of workers.

Discussion

PT Bintang Asahi Textile Industry in the production process to apply rotational working time *(Shift work*), This is because there are machines that operate for 24 hours. Rotating work time (shift work) is also valid for one unit in the PT Bintang Asahi Textile Industry, namely Ministry Spinning Winding section. Working time prevailing among which the morning shift (6:00 to 14:00), the day shift (14:00 to 22:00 GMT), and the night shift (22:00 to 06:00 GMT), wherein rotation of shifts in force in the PT Bintang Asahi Textile Industry is 3 days.

Shift work in addition to having a positive impact is to maximize resources but also have a negative impact such as the physiological aspect. The process of physiological disruption of circadian rhythms derived from the process. Circadian rhythms are the processes that are interconnected experienced by the body to adjust to the changes in time for 24 hours. The results showed that the number of respondents in the Department Spinning Winding section experiencing blood pressure every shift showed different results[4].

Measurement of systolic blood pressure and diastolic blood pressure of workers do Polyclinic room according to each work shift, namely the morning shift, day and night. For the morning shift was measured before work at 06.00 pm, while after work was measured at 13.00 pm. For the afternoon shift was measured before working at 14:00 pm, while after work at 21:00 pm, and on the night shift for the prior work was measured at 05.00 pm and after work was measured at 05.00 pm. Measurements

were made using blood pressure meter Type digital OMRON HEM 7130.

Based on these results it is known that the majority of respondents Ministry Spinning Winding section increased diastolic blood pressure. Chi Square test results show the p-value obtained for systolic blood pressure is p = 0.043 <0.05 and diastolic blood pressure was p = 0.007 <0.05, meaning there is a shift in the blood pressure of workers exposed to noise exceeding NAB Department Spinning Winding part PT Bintang Asahi Textile Industry. These results are consistent with research that has been done, showed a highly significant relationship between work time with the blood pressure in workers exposed to noise at the Weaving (Weaving)[6].

Any complaints regarding blood pressure experienced by the respondent Ministry Spinning Winding section can have negative impacts for the job. So necessary to control, reducing the causes of blood pressure that is by checking the blood pressure on a regular basis, regulating hours of work with adequate rest periods, alternating current job was already uncomfortable, consume foods that contain lots of fiber and create the atmosphere of a healthy work environment, convenient and secure[5].

In an effort to reduce blood pressure PT Bintang Asahi Textile Industry, especially in the Department of Spinning section Winding by way of provision of nutritional supplements for workers, in addition to the provision of space adequate rest, where the break room should be comfortable and safe like having no distance is too close to the workplace where the source of the work environment causes blood pressure.

PT Bintang Asahi Industrial Textiles installs noise absorbers made of thick plastic placed on the road between work units, besides that it also carries out engine cleaning every few hours and the provision of Ear Protective Equipment (APT), but the majority of workers don't want to use it because it's uncomfortable. This effort needs to be evaluated, because the effort cannot control the noise so that during the research, the researchers felt the noise in the Winding Spinning Department was quite loud[3,8]. There are many engineering controls that can be done to reduce noise levels in the workplace such as replacing old, worn or hardened engine components such as rubber seals, gear and time belts, and tightening engine parts that start loose, especially the part that is connected to the bolt connection[7].

Conclusion

Based on the analysis and discussion in this study that showed no association with blood pressure shift workers Spinning Department Winding part PT Bintang Asahi Textile Industry showed a p-value equal to 0.043 <0.05 for systolic blood pressure and blood pressure after work p- value of 0.007 <0.05.

Expected to provide space adequate rest, where the break room should be comfortable and safe from environmental factors work, put a damper such as rubber pads on machines that existed at the Department of Spinning section Winding and perform machine maintenance on a regular basis, especially on machines that already wear and is expected to provide earplug as Ear Protective Equipment (APT).

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Is Osteopontine of Value in Diagnosis of Knee Osteoarthritis?

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Abstract

Background: Osteoarthritis is a painful chronic joint disease characterized by structural changes to the whole joint, including loss of articular cartilage, development of osteophytes, synovial inflammation, subchondral bone changes, meniscal damage, muscle weakness, and ligamentous laxity.

Aim of the Work: To detect osteopontine (OPN) in knee osteoarthritis.

Method: 60 patients diagnosed as primary knee OA fulfilling Arthritis Rheum 1986 OA classification criteria, And 60 healthy control were included. All patients subjected to through history taking and full examination, body mass index, plain x ray knees PA view to assess severity according to Kellgren and Laurence grading, plasma and synovial fluid OPN levels, and plasma OPN for control. Assessment of pain for OA patients by patient pain visual analogue scale (VAS) and for functional status by Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), ESR,CRP were done.

Results: There was significant difference between both groups regarding plasma osteopontine ($p<0.0001$), OPN levels in OA patients in plasma and synovial fluid was correlated with each other ($p <0.0001$), patient pain VAS, WOMAC score, K-L grading were correlated with plasma OPN levels with p value (0.001, <0.001, <0.001), and with synovial fluid OPN levels in primary OA patients with p value (0.008, <0.001, <0.001) respectively. ESR positively correlated with plasma OPN $p=0.004$.

Conclusion: OPN is higher in OA patients more than control, and it is higher in synovial fluid than plasma in knee OA patients, OPN correlated with markers of systemic inflammation and has impact on functional status so it can be used as a diagnostic and prognostic factor in knee osteoarthritis.

Keywords: *Osteoarthritis–OPN, ESR, synovial.*

Introduction

Osteoarthritis is a painful chronic joint disease characterised by structural changes to the whole joint including: loss of articular cartilage, development of osteophytes, synovial inflammation, subchondral bone changes, meniscal damage, muscle weakness, and ligamentous laxity. It results from a complex interplay of genetic, metabolic, biomechanical, and biochemical factors. At the knee, osteoarthritis most commonly affects the medial tibiofemoral and patellofemoral joint compartments. (1). Biochemical markers can be used to detect the disease and determine its severity. Therefore the extracellular matrix proteins were crucial to the occurrence and development of osteoarthritis. some extracellular matrix proteins such as osteopontin (OPN) was found to play important roles in promoting the inflammatory occurrence of cartilage cells in knee osteoarthritis, As an important extracellular matrix protein, OPN can mediate cellular growth, survival, adhesion and migration in osteoarthritis(2).

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Aim of the work: To detect osteopontine (OPN) in knee osteoarthritis.

Patients and Method

The study conducted in Minia university hospital, included 60 patients with primary knee osteoarthritis (group I) and 60 apparently healthy controls (group II), patients in group I was complaining of knee effusion candidate for aspiration for detection of synovial fluid OPN level, both groups also were tested for plasma OPN level. All patients fulfilled criteria for diagnosis of primary knee osteoarthritis[3] were included as (group I). Sixty apparently healthy volunteers were served as a control group (group II).Patients with other rheumatological diseases as rheumatoid arthritis, systemic lupus, gouty arthritis, Other forms of arthritis, cancer or other chronic inflammatory diseases, Secondary knee osteoarthritis, Diabetes mellitus were **excluded** from the study

Statistical Analysis: Analysis of data was done by personal computer using SPSS (Statistical program for social science) version 16.The data of all software patients and controls were fed into an IBM personal computer. Data were expressed as mean ± SD for parametric variables and as number and percent for non-parametric variable. Comparison between groups for parametric data was done by independent samples t-test (unpaired t-test). The difference was considered significant if P <0.05. The Bivariate Correlations procedure computes Pearson's correlation coefficient with its significance levels. Pearson's correlation coefficient is a measure of linear association for parametric variables and Sperman-rho correlation coefficient for nonparametric variables.

Results: Characters of OA patients; demographic data, laboratory investigation, functional status and radiological KL grading in table 1

Table 1: Characters of OA patients

Parameters Mean±SD and/or n (%)		OA patient n.= 60
Age (y)		46-72(56.3±7.95)
DD (y)		2-10 (5.8 ±2.33)
BMI	Over weight	4 (6.7%)
	Obese I	16 (26.7%)
	Obese II	24 (40%)
	Obese III	16 (26.7%)
VAS		5-10 (7.53±1.22)
WOMAC total score		45-96 (74.26±14.07)
KL grading	I	5%
	II	35%
	III	38.33%
	IV	21.67%
Plasma OPN		92-222 (136.67±35.1)
Synovial fluid OPN		162-298 (218.4±37.7)
ESR mm/1st hour		8-36 (23.97±7.4)
CRP		53 (88.3%)

Functional status and severity in group I (OA patients): Table 2 shows that patient pain VAS, WOMAC score, K-L grading were correlated with plasma OPN levels with p value (0.001, <0.001, <0.001), and with synovial fluid OPN levels in primary OA patients with p value (0.008, <0.001, <0.001) respectively. ESR positively correlated with plasma OPN p= 0.004.

Table 2: Correlation between plasma & synovial osteopontine with demographic data, disease functional and severity indices in OA patients

Parameters r (p)	Plasma OPN	Synovial fluid OPN
Age	0.032 (0.730)	0.800 (<0.0001)
DD	0.155 (0.236)	0.390 (0.002)
BMI	0.629 (<0.0001)	0.074 (0.574)
Patient pain VAS	0.431(0.001)	0.338 (0.008)
WOMAC totoal score	0.342 (<0.001)	0.358 (<0.001)
KL grading	0.358 (<0.001)	0.680 (<0.001)
ESR	0.362 (0.004)	0.087 (0.510)
CRP	0.895)) 0.017	0.689 (0.455)

Discussion

Osteoarthritis (OA) is a low-grade inflammatory disease of synovial joints and the most common form of arthritis[4]. It is a leading cause of chronic pain and physical disability in older individuals. OA is one of the most costly and disabling forms of joint disease, being far more common than rheumatoid arthritis (RA) and other forms of joint disease[5].

The increased expression of OPN has been observed in the joints of patients that were reported to be correlated with the severity of joint lesion and inflammatory status in the OA patients[6].

In our study patient pain VAS, WOMAC score, KL grading was positively correlated with plasma and synovial OPN levels.

Plasma osteopontine show statistically significant difference between both groups (p**<0.001**), and synovial fluid OPN was significantly higher than paired plasma level in primary OA patients.

In agreement with[7] who found in a similar study on Plasma OPN (in patients and control) and in synovial fluid OPN (in patients) levels in knee OA patients, that patients had higher plasma OPN concentrations compared to healthy controls (P <0.0001). Also OPN levels in synovial fluid were significantly higher with respect to paired plasma samples (p <0.001).

In another study done by **Qin et al.**[2], who examined the synovial fluid from 42 patients with knee OA and 40 cases of the normal control group had effusion due to traumatic causes as meniscus injury or lower extremity fracture surgery in the hospital at the same period for OPN level and demonstrated that the expression levels of OPN in OA group was significantly higher than those in the control (post traumatic) group, (P<0. 05)

In agreement with **Haider et al.,**[8] who found In their study about OPN in knee OA patients and control, that plasmaOPN level significantly correlated with synovialOPN in OA patients (r =0.806, P < 0.001), a significant difference between patients and controls as regards the plasma OPN levels (t =8.534, P < 0.001), OPN in synovial fluidwas higher with respect to paired plasma. Also, OPN level in bothplasma and synovial fluid was significantly correlated with severity of knee pain (r =0.878, r =0.795, p <0.001).

In Conclusion: this study suggests that OPN is an inflammatory marker that can be used as a diagnostic and prognostic marker in knee OA.

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A Prospective Study of Effectiveness of Pre-release Intensive Program for Prisoners in Thailand

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Abstract

Background: The intensive program for pre-release prisoners has been developed in Thai Correctional System with a prospective cohort study design on the effectiveness of treatment program before releasing prisoners. The samples were 850 prisoners who were drug users. The aim of this was to compare the effectiveness of the pre-release intensive program on the intensive group with the normal group of prisoners in the correctional system.

Method: Data were collected by using questionnaires and interview which were conducted in the areas under Department of Corrections, Thailand. Inference statistics were used for the analysis in this research.

Results: Firstly, it was found that the prisoners who received the intensive Program improved their criminal rate with Hazard Ratio = 0.294 (95%CI, 0.136-0.632) (p-value < 0.05), and the intensive program was applied in group activities to solve the problem of prisoners. Secondly, based on the analysis using Generalized Estimating Equations (GEE) to estimate the distance from criminal rate, it was found that there were no differences among the prisoners who entered the treatment program in the intensive group and the control group that have been released on time with statistical significance (p-value < 0.05).

Conclusions: Our findings indicated that the intensive program was effective for pre-releaseprisoners who aredrug users form the Correctional. The duration of the implementation of the program was 4 monthsand the behavior of the prisoners must be observed constantly.

Keywords: *Pre-release Intensive Program, Prisoners, Drug Users.*

Introduction

UNODC (United Nation Office on Drug and Crime) reveals the epidemic trend of addictive substance, which was shown by comparative analysis of information of asset in dispute in 2017 that more than 271 million people or 5.5 percent of the population aged 15-64 years old used to consume one kind of addictive substance. According to World Drugs Report, we found that most popular drugs were Marijuana, Opium, Cocaine and Amphetamine-Type Stimulants (ATS), which have been spreading in many continents.[1] Continuous Household Survey in estimating addictive substance users within the same period of time in Thailand found that Thai people aged 12-65 years old used to consume one kind of addictive substance approximately for 3.50 million people or 58.2 people per 1,000 people. Moreover, 1,425,342 people used to consume one kind of addictive substance within 1 year.[2] The number of drug users has been increasing accordingly to the increase of treatment rate. The ratio of male and female patients was 90% and 10%, respectively, and there were new patients than current patients about 80%.[3]

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Overcrowding in prisons causes many problems such as handling problem, behavior reforming and offence repetition. Updated convict statistic reveals that prisoners with offence against narcotics are the highest proportion in the prison compared to other kinds of prisoners. In addition, more than 50% of them will make the same mistake within the first 3 years.[4,5]

At present,Therapeutic Community (T.C.), which is called "CARE Model" (C=Corrections, A=Addiction, RE=Rehabilitation), has been used for the patients in prisons since 1994 by using knowledge and experiences from Communita in Control Organization (Italy) and Day Top Organization (USA) to adapt and properly apply with the prison's condition, discipline and Thais culture to reform prisoners' attitude, emotion and behavior. The treatment has been widely used in 85 prisons all around Thailand. However, the limit of prison workability, caused by outnumbered prisoners, causes the treatment area unable to be specifically separated up to each type of patients and the patients who have completed the treatment still need to live with other prisoners. As a result, most prisoners do not have enough motivation for drug stoppage and behavior reforming. [6, 7, 8]

The indicator for successful performance and advantage of the treatment has been still vague in quantity and effectiveness for accessibility, harm reduction of drug addict, preparation result before freeing the patient who does not need to be captured in the prison. There are many arguments about performance, worthiness, effect on society, economy, crime, drug users and implementation of concrete procedures for reducing society's fear and congestion inside the prison.[9] An additional study on wellness of mental health of the drug users in terms of recognition, increasing of positive thinking in themselves and life's goal reveals that the drug users stops addicting to drugs and satisfy with their lives and have more self-esteem. So, they are ready to face with daily life's problems and understand how to solve the problems by themselves without using the drugs. [10, 11]

The researcher had an idea to develop the new intensive treatment program for prisoners who could be freed prior to the schedule. This new program contains 2 main components: 1) solving and development procedures that make prisoners can solve their addictive drugs problem in an uncertain circumstance and 2) reinforcing all physical & mental health, emotion, social of the prisoners, mainly focusing on the development of mental health until they can normally live with the society and will not go back to the addiction circle and crime. It is the study to assess the effectiveness of the intensive program for preparing the prisoners who have been captured by offence against narcotics before they are in the Parole process of Department of Corrections. The mentioned program was developed by the researcher who had compared the overall result between normal prisoners and pre-release prisoners. The results will be beneficial for Department of Corrections, Department of Probation, Office of the Narcotics Control Board, Royal Thai Police and Department of Public Health for the remedy of the prisoners with efficient and practical process.

Material and Method

Study Design: This research was a prospective cohort study design to compare effectiveness of intensive program and the normal program which can lead to the fact. Data were analyzed by analytical statistics method.

Population and Sample: The population and sample in this study were from 12 areas in Department of Corrections, which all of type in Thai Correctional were accept into this study.

Subjects Recruitment: A sample of 850 prisoners was recruited from the correctional in Thailand, applying a criterion based selection method as a group of drug prisoners, were selected by the purposive random sampling. According to the selection criteria, about 32,000 people were sent to Department of Corrections for the selection of male-female prisoners. The samples must have a history of drug abuse alone with no other offenses. The sample size was calculated based on Cohen (1992)[12]:the effect size and the confidence level were at 0.05, so the sample size was 2,900 people, who were 850 expected to volunteer to participate in the project.

Experimental Procedures: The intensive program consisted of treatment and rehabilitation procedure for pre-release drug users in prisons. The duration of program was 4 months. It consisted of 4 activities as follows: 1) development of the spiritual condition with religion, 2) development of the behavioral therapy, 3) relapse prevention skill and 4) development of living management skill. The effectiveness of pre-release intensive programwas compared during the process of data collection at baseline, and after the release at 3, 6, 9, 12 months.

Measurement and Instrument: A structured questionnaire was developed based on literature reviews in response to the research questions. The questionnaire consisted of 2 parts: Part 1: Participants' characteristics and Part 2: Distance from Criminal Scale. It was applied for interviews to achieve the research objectives. The context in prison, Department of Corrections/ Correctional Institution for drug users which affected to the effectiveness of pre-release intensive program must be considered. In addition, Content Validity Index (CVI) was 0.98 which passed the quality control of the research instrument. The instrument had high level of reliability with Cronbach's alpha of 0.70, 0.93.

Data Collection: Data were collected from July 2016 to April 2018. The interviews with the participants in operational research were focusing on the content of the intensive program, follow-up results and effectiveness of the program as the context of operational processes.

Statistical Analysis: Research information made the table analysis for data clustering. The assessment of reliability (credibility) was also considered in this research. Data double entry was used to construct the research database. Data exploration was done to correct the out of range, outliers, and missing value problems. Percentage, mean and standard deviation and inferential statistics, including Chi-square and Survival time to criminal event by Hazard ratio (95%CI), Generalized Estimating Equations (GEE) were employed.

Result

The participants' characteristics were shown in Table 1. Among 850 respondents who volunteered in this study, there were 100% of male in the intensive group and 93.25% of male and 6.75% of female in the control group. The mean age of the intensive group was 30.24 years (SD = 7.19) and that of the control group was 32.28 years (SD = 9.23). The mean family income was 24,128.81 baht (ranging 6,000-200,000 baht). Chi-square tests demonstrated the differences in gender, marital status, occupation and relationship in the family.

The comparison of time to criminal event was presented in Table 2. The hazard ratio among the prisoners who were released within the group was 0.294(0.136, 0.632), p-value < 0.05. Among 850 drug users, age, marital status, relationship in the family, and substance currently in use were found to be associated with the program for pre-release.

The effectiveness of the intensive program for pre-release offenders in Thailand was presented in Table 3. The Generalized Estimating Equation of the intensive group was (GEE) 0.054 (-0.000 to 0.100), p-value < 0.05.

Table 1: Characteristics of participants from baseline interview in each group (self-report)(n=850)

Participants' Characteristics	Intensive Group Number (%)	Control Group Number (%)	p-value
1. Gender			**0.000***
• Male	427(100)	359(93.25)	
• Female	0(0)	26(6.75)	
2. Age			**0.000***
• Minimum	17	19	
• Maximum	60	70	
• Mean; S.D.	30.24; 7.19	32.28; 9.23	
3. Marital status			**0.009***
• Single/Widowed/Divorced/Separated	274(64.17)	280(72.73)	
• Couple	153(35.83)	105(27.27)	
4. Income (Baht)			**0.000***
• Minimum	5,000	3,500	
• Maximum	30,000	80,000	
• Mean; S.D.	10,950.82; 2,582.20	9,846.75; 5,308.32	
5. Family Income (Baht)			**0.000***
• Minimum	6,000	5,000	
• Maximum	200,000	100,000	
• Mean; S.D.	24,128.81; 14,396.91	19,654.55; 12,554.99	

* p-value < 0.05

Table 2: Comparison of Time to Criminal Event (n=850)

Variable	Time to Criminal Event	
	Hazard Ratio (95% CI)	p-value
1. Group	0.294(0.136-0.632)	0.002*
2. Gender	1.640(0.384-7.010)	0.504
3. Marital status	1.393(0.704-2.756)	0.341
4. Habitat	0.917(0.422-1.994)	0.828
5. Relationship in the Family	1.612(0.379-6.847)	0.518
6. Substance Currently in Use	0.980(0.546-1.758)	0.945

* p-value < 0.05.

Table 3: Description and comparison of Distance from Criminal Scale variables between the intensive group and the control group at baseline, 3rd month,6th month, 9th month and 12th month by analysis of covariance and generalized estimating equations (GEE)

Variable	Group	Baseline	Follow-up afterthe intensive program training				Overall
			3rd month	6th month	9th month	12th month	
Distance from Criminal Scale	Intensive	53.81±0.10	46.70±0.49	44.09±0.57	41.13±0.56	37.88±0.50	
	Control	53.89±0.11	48.79±0.44	45.34±0.54	30.10±0.10	30.41±0.88	
	Mean Difference	NA	-2.09	-1.25	11.02	7.47	-3.98
	95%CI	NA	-3.38 to-0.79	-2.79 to 0.29	9.88 to12.16	6.45 to8.49	-4.71 to-3.25
	p-value	NA	0.00	0.11	0.00	0.00	0.00

*Mean difference (Intensive Program) was adjusted for baseline measurements and each visit using analysis of covariance (ANCOVA) and for overall generalized estimating equations was implemented under generalized linear model frameworks.

Discussion

The intensive program was rehabilitation for drug users in the correctional system. It was a specific program which can classify drug users, drug addicts, and violent offenders or retailers' types. The definition of patient characteristics was also included in the program for prisoners who volunteered or were motivated to change behavior. The technique which was focus-group of therapeutic community program for prisoners can help them to develop themselves to live well in society,which can affect the increase of program efficiency. The prisoners have known their self-worth after being treated with the Intensive Program.[13]

The impunity was one of all measures which can reduce the number of prisoners and the congestion in prisons, save the budget for the prisoners and control them easier according to the Royal Commission on Corrections, 1936, Section 32(5). The prisoners with good behavior endeavor in studying and good effectiveness in working or doing the favor for government officers are considered to get the opportunity to leave the prison and live with family and society before the penalty sentence under the strictly defined conditions. The community also has the opportunity to participate in solving, treating, and modifying the behavior and attitudes of the prisoners so that they are ready to behave as a good citizen and able to work honestly and live well with others after being impunity without returning to commit the same mistake again. Reducing the number of prisoners and overcrowding in prisons can save budget for prisoners and the control of prisoners to a certain extent. [14, 15]

A study on the effectiveness assessment of the program and rehabilitation of drug users has been working effectively during the preparation time before prisoner's release. The assessment must be continually done while the prisoners were in the correctional system.[16,17,18] After the prisoners were sentenced as being impunity, they must be followed up to assess their behavior while living in a community. It must be associated with the integrated cooperation between government and community organizations.[19, 20, 21]

Conclusion

The effectiveness of pre-release intensive program via correctional therapy can modify the behavior of the prisoners with the pattern of group process. The

focus-group process can help the members to express their feelings, emotion and self-confidence as well as to accept the other members' opinions. Therefore, the system of rehabilitation in Department of Corrections must include classification, screening for prisoners in many of drug cases to assess the severity of the problem who have developed habits, Department of Corrections have qualification to meet the criteria for suspension of special cases for pre-release Intensive Program could be released before 2 years after being released that would help drain prisoners and decreased budget of Department of Corrections about 280 million baht in a 2 year period, and also helps improve the quality of life for prisoners due to be released prematurely could live in society as usual.

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Conflict of Interests: The authors declare no conflicts of interest.

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Ethics Statement: The ethics statement of this study was conducted by the research team. At the stage of data gathering, verbal consent was required. Personal identifiers (names, full addresses) were stripped from the data set. This research project was approved by the Ethics Committee Khon Kaen University (HE591226) based on the principle of Declaration of Helsinki, and ICH GCP standards.

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Factors Associated with Behavior Usage of Respiratory Protective Equipment among Sugarcane Factory Workers in Northeast of Thailand

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Abstract

Several sugar industries in Thailand are highly effected to environmental health, including a safety at work, mainly the areas surrounded of bagasse.

This research aimed to study on factors associated with behavior usage of Respiratory Protective Equipment (RPE) among sugarcane factory workers. A cross-sectional study was conducted among 588 workers at 4 sugarcane factories in Northeast of Thailand, between December 2017 to April 2018. Workers were selected by multi-stage random sampling to completed structure questionnaires. The multivariable analysis was used by multiple logistic regressions.

The majority were males (71.94%). Their mean age was 38.28 (±10.56) years old. Financial status was poor (65.65%). Department were juice extraction machine (67.52%). The majority types of RPE usage were cotton masks (94.56%) and their behaviors usage of RPE had good level (64.80%, 95% CI: 60.92-68.67). Additionally, factors associated with good behavior usage of RPE were included age (AOR = 1.65, 95% CI: 1.14 to 2.38; p = 0.007), financial status (AOR = 1.57, 95% CI: 1.07 to 2.29; p = 0.021) and department of work (AOR = 0.66, 95% CI: 0.31 to 1.40; p = 0.017).

Almost two-third of sugarcane factory workers had good behavior usage of RPE. Work safety awareness is important to prevent and promote among sugarcane factory workers to the adaptation their working environment.

Keywords: *Behavior, Bagasse, Respiratory Protective Equipment (RPE), Work-Safety.*

Introduction

In Thailand, 16.8% workers are involved in manufacturing industry, normally the labor in the system preferred to work in factory and machinery operators [(12)]. It's impact has increased due to lack of public awareness, and exposure of workers to inferior air quality at the workplace leads to ill health[(7)]. Personal Protective Equipment (PPE) is worn by workers[(15)]. Nevertheless, Respiratory Protective Equipment (RPE) is not always used, even in situations with high exposure risk[(13)].

Therefore, The occupational health problems in the sugarcane industry had existed in more than 40 countries in the world[(9)]. In 2016 Sugarcane on average accounts for about 80% of global sugarcane production. Production has become increasingly concentrated. The trend of top ten countries of sugarcane producing in 1980 accounted for 56%, whereas in 2016 accounted for 76% respectively. More interestingly, Thailand was third ranked after Brazil and India among top ten of

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sugarcane producing in the world[6]. Harvesting occurs in dry season between mid-December and the end of April[8]. Sugarcane industry constitutes one of the big industries, there are 55 plants in Thailand and 20 plants in Northeast of Thailand[2].

The working conditions of the sugarcane industry workers are extremely poor. The occupational health and safety issues in the workplace are significant due to the diversity of occupational safety factors. That the workers are exposed to high concentration of excessive heat, high intensity noise, high intensity of dust in cane yard section, bagasse dust in mill and bagasse baling section are the main causes of respiratory problems among these workers[10]. We found out that the workers at sugarcane factory have faced with health and sanitation problems because there are variety issues which do harm to their health, especially the concentration of bagasse. Inhalation of bagasse dust causes a respiratory disease called Bagassosis[11].

If the workers who work in the environment which are insufficient oxygen or dusty area, the RPE is necessary indeed. It is also reducing any loss and risk to the workers because it is harmful to their health and might cause of lung cancer and respiratory deceases[4]. Wearing RPE could prevent respiratory deceases which be able to reduce the bagasse dust. It is an important preventive measure to their career. Anyway, it is totally safe their health if they do wear them correctly and the equipment have been in good maintenance constantly. However, the strictly usage of the RPE by workers or company or workers themselves are still the main majority issue[14].

Therefore, this study aimed to investigate the factors which relate to behaviors of usage the RPE of workers in sugarcane factory. A sample group was collected from workers within Northeast of Thailand.

Material and Method

Study Design and Sampling: A cross-sectional study was conducted in 4 factories in Northeast of Thailand. Data was collected from December 2017 to April 2018. The sample size was calculated following formula[5]

$$np = \frac{n_1}{1 - \rho^2_{1,2,3.....p}}$$

The approximate sample size was 327 which were further adjusted to control the over-fitting using the rho (ρ) of 0.50 and variance inflation factor (VIF) equal to 2.00. Therefore, the total number of the sample was 588. Data sampling processes: Firstly 4 factories in Northeast of Thailand were randomly selected. Then 3 departments facing with dusts at the working area were drawn. There were 7,965 sugarcane factory workers registered at the department of industrial work. Finally, all participants who met the inclusion criteria were randomly selected proportionally to size of the samples added to the total of 588 samples. (Figure 1).

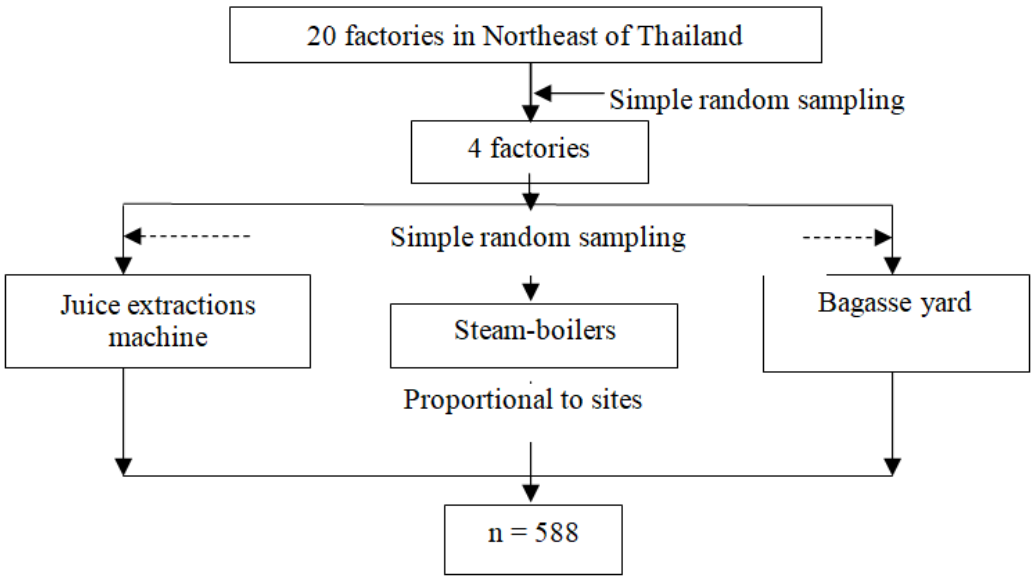

Figure 1. Flowchart of study design and sampling of sugar factory workers

Questionnaires: The questionnaire was modified from reviewed literatures based on research questions. The questionnaire contained 3 parts which were: 1) Demographic Characteristics, 2) Attitude to the usage of the RPE, and 3) The behaviors of usage the RPE. The questionnaire was validated by 3 experts and tested for reliability.

Data Analysis: Descriptive and analytical statistical data were analyzed with STATA® (version.13; college Station, TX, USA: Stata Corp) was used to analyze the data. Demographic characteristics of the participants were described as frequency and percentage for categorical data; mean and standard deviation for continuous data. Inferential statistics, a simple logistic regression, was used for bivariate analysis to identify individual factors associated with good behaviors for usage of RPE. The factors that had *p*-value <0.25 were processed into the multivariable analysis using multiple logistic regression and reported the adjusted odds ratio (AOR) and their 95% confidence interval (95% CI) and *p*-value<0.05 was considered as statistically significant.

Result

Demographic Characteristics: The total 588 sugarcane factory workers in Northeast of Thailand, the majority were males in 71.94% and average age was 38.28 years with a range of 19-69, level of education was primary school, and marital status was marriage, average income each month 10,146 THB. Financial statuses were poor 65.65%. Majority it's in juice extraction department is 67.52%, worked less than 5 years were 42.69%. Most of them get the information how to use the RPE from safety officer were 77.89%. Principally they wear cotton masks while working at factory is 94.56% (Table 1).

Table 1: Number and percentage in personal of the workers (n=588)

Characteristics	Number	Percent (%)
1. Gender		
Male	423	71.94
Female	165	28.06
2. Age (Years)		
Mean (±SD)	38.28 (10.56)	
Median (min : max)	37.00 (19.00:69.00)	
3. Monthly Average income (Baht)		
Mean (±SD)	10,146 (2438.35)	
Median (min : max)	9,000(4800:23000)	
4. Financial status		
Poor	386	65.65
Good	202	34.35
5. Marital status		
Unmarried	173	29.42
Married	415	70.58
6. Education		
Primary school	190	32.31
High school	302	51.36
High vocational Certificate/Diploma	96	16.33
7. Department		
Juice extraction machine	397	67.52
Steam-boilers	158	26.87
Bagasse yard	33	5.61
8. Working period (years)		
≤ 5	359	61.06
6-10	128	21.77
≥10	101	17.18
9. Source of information		
Safety officer	458	77.89
Supervisor	414	70.41
Brochure/booklet	87	14.80
Internet	57	9.69
Information board at the factory	219	37.24
10. Types of RPE		
Cotton masks	556	94.56
N95 Masks	137	23.30
Shirts	132	22.45
Loincloth	15	2.55

The total 588 sugarcane factory workers, majority were attitude of usage of RPE are in good level be 79.42% (95% CI: 76.14-82.70) then, medium level is 20.41% (95% CI: 17.14-23.68) and the attitude with poor level be 0.17% (95% CI: 0.002-0.005) (Table 2)

Table 2: Prevalence of attitude-levels of using the RPE

Level of Attitude	Number	Percent (%)	95% CI
Good	467	79.42	76.14-82.70
Medium	120	20.41	17.14-23.68
Poor	1	0.17	0.002-0.005

Mean (SD) = 48.75(05.76); Median (Min: Max) = 48(14:60)

The total 588 sugarcane factory workers, majority were behavior of usage of RPE are in good level 64.80% (95%CI: 60.92-68.67) then in medium level is 33.16%

(95%CI: 29.35-36.98) and poor level is 2.04% (95%CI: 0.89-3.19) (Table 3)

Table 3: Prevalence of behavior-levels of using the RPE

Level of behavior	Number	Percent (%)	95%CI
Good	381	64.80	60.92-68.67
Medium	195	33.16	29.35-36.98
Poor	12	2.04	0.89-3.19

Mean (SD) = 40.71(4.84); Median (Min: Max) = 41(20:48)

Factors associated with behavior of usage the RPE: Bivariate analysis: Bivariate analysis on the association between each independent variable and good behavior usage RPE among sugarcane factory was performed presenting the crude odds ratio (OR) with 95% CI, and p-value. All factors that had p-value <0.25 were proceeded to multivariable analysis by using multiple logistic regression. (Table 4)

Table 4: Factors associated with behavior of usage the RPE: Bivariate analysis.

Variable	Number of Event	% of Event	Odds ratio	95%CI	p-value
Overall Good behaviors	381	64.8	N/A	60.92-68.67	N/A
1. Level of attitude					**0.047**
Poor	121	57.02	1		
Good	467	66.81	1.52	1.01 to 2.28	
2. Age (years)					**0.005**
<= 39	335	60.00	1		
>=40	253	71.15	1.64	1.16 to 2.33	
3. Financial status					**0.096**
Poor	386	62.44	1		
Good	202	69.31	1.36	0.94 to 1.95	
4. Department					**0.015**
Juice extraction machine	397	68.77	1		
Steam-boilers	158	56.33	0.58	0.40 to 0.86	
Bagasse yard	33	57.58	0.62	0.29 to 1.27	
5. Getting information from safety officer					**0.020**
No	130	56.15	1		
Yes	458	67.25	1.60	1.08 to 2.39	
6. Information board in the factories					**0.103**
No	369	62.33	1		
Yes	219	68.95	1.34	0.94 to 1.91	
7. Use shirts to prevent dust once on working					**0.009**
No	456	62.06	1		
Yes	132	74.24	1.76	1.14 to 2.72	
8. Use loincloths to prevent dust once on working					**0.008**
No	573	64.05	1		
Yes	15	93.33	7.86	1.02 to 60.19	

Factors associated with behaviors of usage RPE: Multiple logistic regression analysis: Multiple logistic regression analysis by Backward elimination indicated that sugarcane factory workers who have group of age over or equal 40 years old was 1.65 times of having good behavior using RPE when compared with those who aged less than 40 years old (AOR = 1.65, 95% CI: 1.14 to 2.38).

Those who have good financial status were much

better 1.57 times of good behavior using RPE when compared with those having poor financial status (AOR = 1.57, 95% CI: 1.07 to 2.29)

Those who worked in the departments of steam-boilers and bagasse yard were 0.59 times and 0.66 times of having good behavior using RPE when compared with those who worked in department of juice extraction (AOR = 0.59, 95% CI: 0.40 to 0.83) and (AOR = 0.66, 95% CI: 0.31 to 1.40) respectively. (Table 5).

Table 5: Factors associated with behaviors of usage RPE: Multivariate analysis

Variable	Number of Event	% of Event	Crude odds ratio	Adjusted odds ratio	95% CI	p-value
1. Age (years)						**0.007**
≤ 39	335	60.00	1	1		
≥40	253	71.15	1.64	1.65	1.14 to 2.38	
2. Financial status						**0.021**
Poor	386	62.44	1	1		
Good	202	69.31	1.36	1.57	1.07 to 2.29	
3. Department						**0.017**
Juice extraction machine	397	68.77	1	1		
Steam-boilers	158	56.33	0.58	0.59	0.40 to 0.83	
Bagasse yard	33	57.58	0.62	0.66	0.31 to 1.40	

Discussion

This study revealed that the good behaviors usage of RPE among sugarcane factory workers were 64.8%. And the associated factors with good behavior of usage RPE among sugarcane factory workers were found 3 factors including: age, financial status and department of work.

The association between age and good behaviors usage of the RPE was consistent with study in Nepalese industrial workers which revealed that increasing of age of workers had associated with good behaviors usage of the RPE[1].

Financial status had associated with PPE[1] where the RPE was one of subset PPE. To the current study, monthly income of workers were about 10,146 THB equal to US dollar about (320$), had received the information how to use the RPE from safety officer were 77.89% that encouraged them using cotton masks of 94.56%.

The department of working, we found that group of worker in steam-boilers department is more likely better behavior usage of RPE than department of Juice extraction 0.59 times. However, sampling group in bagasse yard, they wear the RPE much better than the steam-boilers department at 0.66 times. The reason of did not use RPE maybe from difficulty in breathing, pain in the ear, small size of the face[3].

Conclusion

Behavior usage of RPE can improve occupational health and safety at workplace among factory workers. Besides, it emphasizes them to practice appropriate behavior of health preventive in workplace. This research has been collected the data from only three departments; juice extraction machine, steam-boilers and bagasse yard. Therefore, we suggest next research should collect the data to cover all work-functions in the factory because they also are risky to inhale the dust while working. The current study of cross-sectional design was first a snap of associated factors with outcome being evident. Then the next study will be conducted on evidence-based recommendations promoting to change behavior in the actual workplace situation.

Research Ethics approval for this study was obtained from the Khon Kaen University Ethics Committee for human Research (HE602331).

Conflict of Interest Statement: The authors declare that no conflict of interest.

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Re-evaluation of Psoriatic Patients with Metabolic Syndrome: A Case Control Study Searching for the Highly Prevalent Criteria

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Abstract

Psoriasis is a common chronic inflammatory skin disorder, presented as erythematous plaques with salmon pink color and silvery white scales. The association between psoriasis and metabolic syndrome have recently demonstrated by many studies, and this link suggested by the presence of systemic inflammatory status with the high level of cytokines. The study aimed to evaluate psoriatic patient who have metabolic syndrome with recording of the frequency of the criteria of this syndrome. Sixty two cases of psoriasis involved in this study with age and gender matched controls. Patient was diagnosed as having metabolic syndrome if he has three or more of the criteria depend upon IDF/NHBLI/AHA/World Heart Federation/International Atherosclerosis Society/International Association. This study revealed that metabolic syndrome occur in a higher frequency among psoriatic patients (58%) than the controls (16%). The highly prevalent criteria among psoriatic patients with positive metabolic syndrome was increase waist circumference at the top (100%) and hypertriglyceridemia came next (69%), with low HDL, hypertension, and raised fasting blood glucose came successively. The study reiterates the fact that Metabolic Syndrome and psoriasis do have a close association. Our study shows that central obesity and hypertriglyceridemia occur with high frequency among psoriatic patients with positive metabolic syndrome.

Keywords: *Psoriasis, metabolic syndrome.*

Introduction

Psoriasis is a common chronic inflammatory skin disorder, presented as well defined plaques with salmon pink color and silvery white centrally attached scales. Psoriasis is considered to be a polygenic disorder[1-3]. Recently, many studies demonstrated the association of psoriasis with systemic disorders like metabolic syndrome, cardiovascular disease, osteoporosis, inflammatory bowel disease, cancer, and depression. Systemic inflammation and the presence of interleukin-6 and tumor necrosis factor-α in high levels suggested the link between psoriasis and associated systemic disorders.[4]

With regards to the immunopathogenesis of psoriasis and metabolic syndrome [chronic inflammation mediated by pro-inflammatory cytokines], both may develop "interdependently". Additionally, "insulin-like growth factor 1" have implicated in psoriasis "as a shared mediator in the proliferation of keratinocyte "and the development of hyperlipidemia and diabetes [5-10].

Chronicin flammation (Th-1 and Th-17) with cytokines dysregulation, in addition to promotion of hyperplasia of epidermis in psoriasis, may also antagonize insulin signaling leading to increase risk of obesity and insulin resistance. In addition, both psoriasis and

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metabolic syndrome sharing the genetic susceptibility by the existence of pleiotropic "PSORS2-4, CDKAL1, and ApoE4" genetic loci[11,12]. Significant clinical implications may be demonstrated in psoriatic patients with metabolic syndrome, especially those on chronic systemic treatments "use them with caution"because the coexisting metabolic disorders may be adversely affected[13].

Aim of our study was to evaluate psoriatic patient who have metabolic syndrome with recording of the frequency of the criteria of this syndrome .

Patients and Method

This case control study was conducted over a period of nine months from October 2018 till march 2019. Sixty two cases of psoriasis involved in this study collected from Department of dermatology in AL-Yarmok teaching hospital in Baghdad province with age and gender matched controls. Psoriasis was diagnosed clinically and suspicious cases proved by histopathological study .Inclusion criteria are those with plaque psoriasis of at least 3 months, more than 18 years old, and not received any systemic medication for psoriasis for at least three months while Exclusion criteria are pustular and erythrodermic psoriasis, those taking systemic drugs in the three months before enrolling, pregnant women and those complaining from other autoimmune diseases .

Questionnaire was designed to obtain the information age,gender, duration of psoriasis,family history, height, and weight . Waist circumference was measured by placing a tape measure around the abdomen at the level of uppermost part of the pelvic bone. Blood pressure was recorded by taking the average of two separated measurements. Body mass index was measured by dividing the weight in kilogram on the square of height in meter and psoriasis severity evaluated by using the psoriasis area and severity index (PASI). Venous blood samples were taken 12 hour fasting status in the morning to measure fasting blood sugar and serum triglyceride in our hospital laboratories .For diagnosis of metabolic syndrome I depend upon "IDF/NHBLI/AHA/World Heart Federation/International Atherosclerosis Society/ International Association for the Study of Obesity, 2009". Patient was diagnosed as having metabolic syndrome if he has three or more of the following :

- waist circumference [>94 cm in men and >80 cm in women].
- serum triglycerides [≥150 mg/dL] or lipid-lowering drugs.
- serum HDL [<40 mg/dL in male and <50 mg/dLin female].
- Blood pressure [≥130/85 mm Hg]or antihypertensive therapy.
- Fasting plasma glucose [≥100 mg/dL] or pharmacologic therapy .

To clarify the effect of difference factors in this study parameters, the "Statistical Analysis System 2012" program was used and Chi-square test applied to compare the significance .

Results

Sixty two psoriatic patients [34 male (55%) and 28 female (45%) with their matched control] enrolled in this study . Their age distribution : 46 (74.2%) between 21 years and 50 years, 10 (16.1%) above fifty years, and only six (9.7%) between 18 years and 20 years. Metabolic syndrome discovered to be presented in a higher frequency in psoriasis patients [36 (58%)] in comparison with controls [10 (16%)], the result is highly significant and the *p*-value was .000001. The highly prevalent criteria among psoriatic patients with positive metabolic syndrome was increase waist circumference [36 (100%)] with same percent in controls with positive metabolic syndrome. Serum triglyceride in the second place (25 patients 69%) with a nearly equal value in control group (7 control 70%).

There were 12 (33%) psoriatic patients with positive metabolic syndrome found to have low S.HDL while in control group only two (20%) appeared to have low value of S. HDL. Elevated blood pressure was noticed in 22 patient (61%), in control group 6(60%) persons have elevated blood pressure . Sixteen (44%) psoriatic patients had elevated fasting blood sugar, in contrast to control group in which there were only 2 persons.

Regarding PASI score among psoriatic patients with positive metabolic syndrome : 32 (89%) subjects with a score less than 8, while only 4 (11%) subjects above 10 body mass index measurement revealed that 16 (44%) patients were obese, 10 patients (28%) were overweight and the another 10 (28%) patients presented with normal weight .

Table 1: The frequency of metabolic syndrome criteria among psoriatic patients in comparison with controls

Metabolic Syndrome Criteria	PSORIASIS GROUB = (62)					CONTRPL GROUP = (62)				
	+ Metabolic Syndrome 36		- Metabolic Syndrome 26		Chi-Square (χ^2)	+ Metabolic Syndrome 10		- Metabolic Syndrome 52		Chi-square (χ^2)
	No.	%	No.	%		No.	%	No.	%	
↑ Waist circumference	36	100	12	46	10.38 **	10	100	22	42	10.16 **
S . triglyceride	25	69	9	35	9.02 **	7	70	26	50	7.25 **
S.HDL	12	33	4	15	6.19 **	2	20	10	19	0.037 NS
Blood pressure	22	61	0	0	12.72 **	6	60	10	19	10.26 **
Fasting blood sugar	16	44	2	8	9.41 **	2	20	4	8	4.39 *

* (P<0.05), ** (P<0.01).

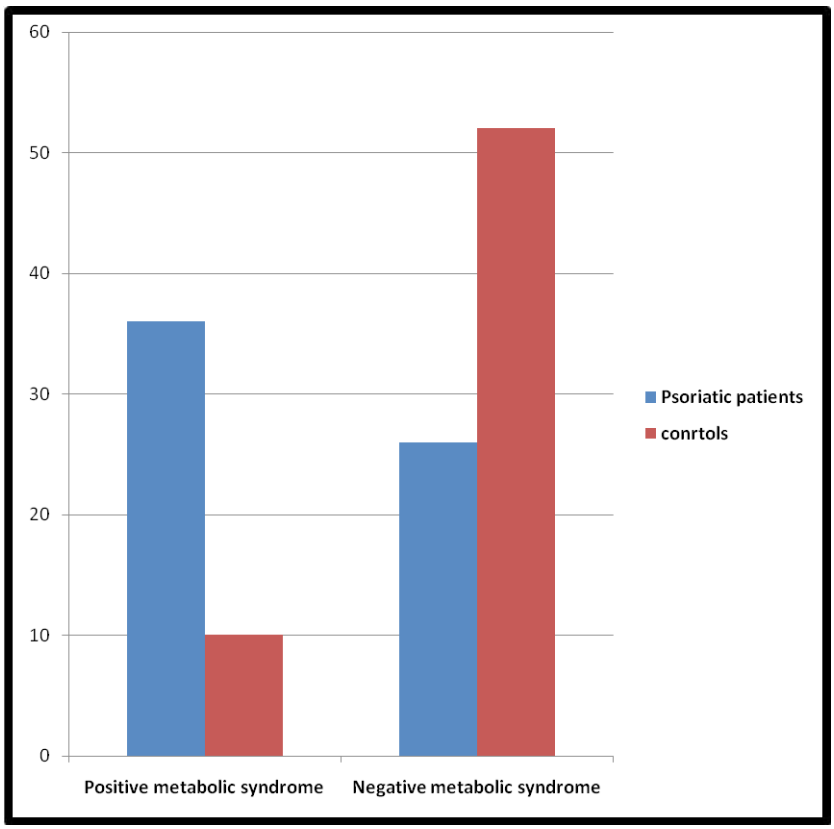

Fig. 1: Prevalence of metabolic syndrome among psoriatic patients in comparison with controls

Discussion

Recently, "the understanding of the role of inflammatory cells and mediators in the pathogenesis of psoriasis" have changed our look to psoriasis from being a cutaneous disease to that of a systemic disorder[14]. Psoriasis and metabolic syndrome are characterized by sharing inflammatory pathways display similar inflammatory profiles with Th1 and over expression of IL-6 and TNF-alpha[15]. Epidemiological link of psoriasis to metabolic syndrome and it's prevalence was suggested by several observational studies (15–25% in the general population)[16].

In this study psoriatic patients examined for the presence of metabolic syndrome in comparison with controls, and data was analyzed to clarify the prevalence of criteria of such syndrome. Males were the predominant sex and maximum number of psoriatic cases (74.2%) was noted in the age group of between 21 years and 50 years. This study revealed that metabolic syndrome occur with a higher percentage inpsoriatic patients (58%) than controls (16%) this appear higher regarding recent case control study by Narendra Gangaiah, NS Aysha Roshin, et al (38% vs. 22%)[17]. Regarding the prevalence of metabolic syndrome criteria among patients :central

obesity (Raised values of waist circumference) was at the top (100%) and hypertriglyceridemia came next (69%), with low HDL, hypertension, and raised fasting blood glucose came successively .

Visceral obesity and type 2 diabetes are the main components of metabolic syndrome. Adipose tissue pathologically has important effects as it infiltrated by macrophages that secrete cytokines in the systemic circulation resulting in a chronic inflammatory state which will lead to the development of numerous diseases associated with obesity[18]. In most international studies obesity appear to be more frequent among psoriatic patients than controls[19]. All psoriatic patients in the present study have increased Waist circumference and visceral obesity could be the possible mechanism that correlate psoriasis with metabolic syndrome and its comorbidities. It was also demonstrated that obesity is a risk factor[more than two times] for developing psoriasis[20]. Middle or older age men with mild obesity are more likely to develop psoriasis as suggested by Naito and Imafuku[21].

Significant elevation in serum triglyceride levels have shown in various studies done in Caucasians[22-24]. In the present study, psoriasis was strongly related with dyslipidaemia. Hypertriglyceridemia represent (69%) in psoriasis group with no difference among controls . Low value of S. HDL was found in 33% of psoriasis group, while it was found to be low in 20% of controls. Similar observations were documented in Lebanon study[25].

Hypertension was documented among 22 cases of psoriatic patients with positive metabolic syndrome, in comparison to controls with metabolic syndrome. Psoriasis patients in regards to the risk of developing hypertension showed modest increase in comparison with the general population[26,27]. No known mechanism explain the relation that link psoriasis tohypertension. Multiple researchers proposed that the major source of angiotensinogen is the adipose tissue and the derived angiotensin II [in addition to its function in salt retention by kidneys] may act asstimulator for T-cell proliferation. Perivascular fat which result from increased visceral adipose tissue "can serve as a reservoir for activated effector T cells" which in turn lead to the promotion of dysfunction in the blood pressure[28].

Regarding the relation between psoriasis and hyperglycemia, there is high risk to develop diabetes in addition to metabolic syndrome[29]. Elevated fasting blood sugar was present in 44% of Psoriatic patients and in 20% of controls. This finding is supported by a study conducted by Samer A Dhaher,and Alaa Abdul Hassen Naif[18,30].

Both hypertension and dyslipidemia cause increase the "systemic inflammatory burden"together with obesity, all of these adds to the comorbidities of psoriasis[31]. PASI score among psoriatic patients with positive metabolic syndrome was less than 8 in nearly 90% of cases, this gave usa negative impression about the relation between the severity of disease and metabolic syndrome. Nisa and Qazi study also found no significant correlation[32].

While studying of body mass index and its association with metabolic syndrome in both groups shows no significance. This comparable with Korean and Norwegian studies were they found a non-statistically significant association with increment in the weight[33,34].

Conclusion: The study reiterates the fact that Metabolic Syndrome and psoriasis do have a close association and showed that central obesity and hypertriglyceridemia occur with high frequency among psoriatic patients with positive metabolic syndrome

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Ethical Clearance: Not required.

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Effect of Dragon Fruit (Hylocereus Polyrhizus) Peel Extract on Collagen Fiber Density of Rat Socket Healing

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Abstract

Collagen has an important role in wound healing to return anatomy and physiology of tissue structure. Dragon fruit is a natural resource that can be used as a therapy that contains flavonoid, saponin, vitamin A, C, and E useful in wound healing. The aim of this study is to prove the effectivity of dragon fruit (Hylocereuspolyrhizus) peel extract gel towards collagen fibers density after tooth extraction of Wistar rat (Rattusnorvegicus). The randomized post test only control groups design was used for this study. The sample consisted of 40 Wistar rats treated with tooth extraction in the left incisive tooth of the mandible. Dragon fruitpeel extract gel 15%, 30%, 60% was given into the socket except for control group which was given CMC-Na gel. Wistar rats was sacrificed on the fourth and seventh days after tooth extraction and prepared for histopathological examination with Masson's Trichrome staining. The data were analyzed with One-way ANOVA and Tukey-HSD test. There are significant differences in the density of collagen in the treatment group concentration 30%. The result showed that the use of dragon fruit peel extract gel affects the density of collagen fibers at 4 and 7 days after tooth extraction. The finding provides dragon fruit peel extract could promote the healing process through the formation of collagen fibers density.

Keyword: *Histopathology, collagen fibers density, tooth extraction, wound healing.*

Introduction

Tooth extraction is one of the most common treatment in dentistry which is indicated for periodontal disease, carries, trauma, or periapicalinfection. Tooth extraction is a minor surgery treatment which is conducted by dentist to remove the tooth from the socket and cause injury around soft tissue[1,2], then wound healing process will occur.

Wound healing is a complicated pathophysiological process. Wound healing consists of several stages, namely stage of acute inflammation, cell proliferation, and maturation.[3] At the stage of proliferation, cell proliferative activity of fibroblasts in the wound area has a central role in forming collagen fiber to begin the wound healing process. Increasing amount of collagen fiber density showed the healing ability.[4] Wound healing process may be hampered by the presence of reactive oxygen stress (ROS) produced by microbes or neutrophils in the wound area. This fact strengthens the opinion that the existence of local antioxidants and antiinflammations in wound area became crucial factors that have promoted the acceleration of the healing process.[5,6,7]

Several studies conducting the process of wound healing using natural materials have been widely applied. The use of natural materials done because it is easy to use, inexpensive, and has an adequate bactericidal or bacteriostatic effect.[8] Natural product, that have evolved over year by years, have a chemical diversity, which ends up in diversity in their biological activities and drug-like properties. Natural product can bear continual use toward meeting the imperative must

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develop effective medication, and that they can play a role within the discovery of medicine for treating human diseases, particularly crucial diseases.[9]

One of these natural materials is dragon fruit (*Hylocereuspolyrhizus*) peel. Dragon fruit is widely spread in Indonesia. Dragon fruit peel contains various compounds including flavonoid, saponin, vitamin A, C, E that are believed to promote wound healing.[10,11,12]

Research on the effectivity gel of dragon fruit peel extract in dosage form in wound healing has not been reported. The extraction is done so that the active substances are needed can be taken optimally. The purpose of this study is to determine the effectivity of dragon fruit (*Hylocereuspolyrhizus*) peel extract gel towards collagen fiber density after tooth extraction of *Wistar* rat (*Rattusnorvegicus*) which was evaluated histopathologically.

Materials and Method

This study is an experimental research laboratory with randomized post-test only control groups design that approved by the Ethical Committee of the Faculty of Dental Medicine, Universitas Airlangga, Indonesia, 278/KKEPK.FKG/KI/2016. The material used is the gel of dragon fruit (*Hylocereuspolyrhizus*) peel extract with a range concentration of 15%, 30%, and 60%. Dragon fruit (*Hylocereuspolyrhizus*) peel that have been dried and used as a powder, then extracted using ethanol solvent and evaporated. The extract was mixed with a gel base material (CMC-Na) and is based on the required concentration. This research used 40 male *Wistar* rats (*Rattusnorvegicus*), aged 2-3 months, and weighing 150-200 grams. Research subjects were divided into 8 groups each consisted of 5 *Wistar* rats. Tooth extraction were performed in the left incisisive tooth of mandible using modificated pliers pull under the effect of ketamine anesthesia by intramuscular inject. Each treatment group was given gel of dragon fruit (*Hylocereuspolyrhizus*) peel extract and control group given only simple gel base CMC-Na using a syringe at a quantity of 2 cc. Then treated in a closed gingival wound sutured with non-traumatic and non-absorbable thread. All *Wistar* rats in each group were sacrificed on the fourth day and seventh day using 10% ether as sedation. Bone biopsies and subsequent histopathological preparation was done using *Masson's Trichrome* (MT) staining, and observed of collagen fiber density.

The data obtained from histopathological examination is quantitative data obtained by scoring the density of collagen fiber under light microscopy performed on one fields of view with 400x magnification. These research data were analyzed with statistical tests of *Kruskal Wallis* and *Mann-Whitney*.[13]

Findings: Data examination of collagen fibers density on the socket healing day 4 and 7 with histopathological preparation using *Masson's Trichrome* (MT) stainingmethod.The collagen fibers showed more density on the socket healing process of day 7 than day 3 after given gel of 30% dragon fruit (Hylocereus polyrhizus) peel extract (Figure 1 and 2).

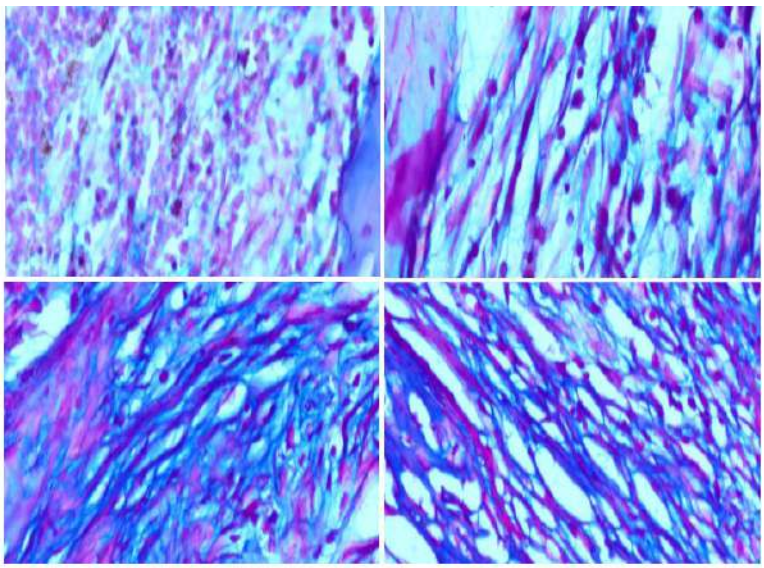

Figure 1. Histopathological image on day 4 MT staining magnification 400x of the groups. A) control group, B group 1 (15%), C) group 2 (30%), D) group 3 (60%)

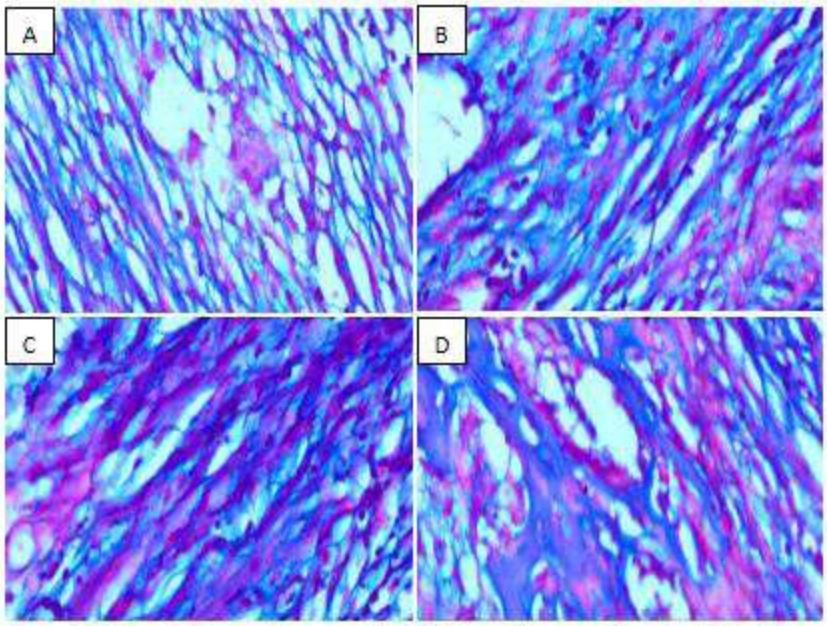

Figure 2. Histopathological image on day 7 MT staining magnification 400x of the groups. A) control group, B) group 1 (15%), C) group 2 (30%), D) group 3 (60%)

The largest score of collagen density present in the sample group which were given gel of 30% dragon fruit (*Hylocereuspolyrhizus*) peel extract, while the smallest score found in the control group. Obtaining data on the score of collagen density in each group performed *Kruskal Wallis* test. Before the *Kruskal Wallis* test, this study shows that the data are normally distributed after the *Kolmogorov-Smirnov* test statistics and heterogenous after *Levene* test. *Kruskal Wallis* test showed significant difference values ($p<0.05$) between treatment and control group. The collagen density of concentration 30% group is more higher than other groups (table 1).

Table 1. Distribution of mean andstandard deviation of collagen fiber density on the fourth and seventh day after treatment

Groups	Fourth day	Seventh day
	X ± SD	X ± SD
Control	0.20 ± 0.447^{a}	1.00 ± 0.000^{a}
G1 (15%)	1.00 ± 0.000^{bc}	2.00 ± 0.000^{bcd}
G2 (30%)	1.80 ± 0.447^{d}	2.60 ± 0.548^{c}
G3 (60%)	1.40 ± 0.548^{cd}	1.80 ± 0.447^{d}

The values with different superscript letters in a column are significantly different ($p<0.05$).

The data of collagen density observation in the fourth day showed significant mean differences in comparisons between the control group with group 1, 2, 3 and group 1 with group 2. Whereas in the seventh day observation, a significant mean differences found in comparisons between the control group with group 1, 2, 3 and between group 2 with group 3.

Discussion

Regeneration process can be seen from the soft tissue that play an important role during the wound healing process such as collagen. Observation of the results of this study was done the fourth and seventh day after treatment for acute inflammatory cells such as PMN, especially neutrophils which will soon be replaced by macrophages on the third day. Socket is filled with granulation tissue and maximum vascularization on the fifth day. The observation of the results on this study was conducted on the fourth and seventh day so that collagen fiber can be seen.[14]

This study used a range of 15%, 30%, and 60% concentration and is a preliminary study using gel of dragon fruit (*Hylocereuspolyrhizus*) peel extract. Extraction of dragon fruit peel was done so the active substances can be taken optimally. Ethanol was used as extraction solvent because it can withdraw the amount of phenolic acids higher than methanol and pure water.[15] The gel used are made of carboxyl methyl cellulosa-natrium (CMC-Na) because CMC-Na is chemically stable.[16]

Wound healing involves several mechanisms, such as inflammatory phase, proliferation phase, and maturation phase. In the inflammatory phase, the objectives are to stop the bleeding and clean the wound area of foreign bodies, dead cells, and bacteria to prepare for the start of healing process. PMN cells migrate into the interstitial area to perform phagocytosis of foreign bodies and bacteria.[17] Flavonoid, saponin, and vitamin A, C, E are contained in dragon fruit peel extract act as antioxidants and antiinflammations. Antioxidants have been reported to have a significant role in the process of wound healing and protect tissues from oxidative damage.[18] Antioxidant mechanism is expected to protect cells that play a role in the process of wound healing and convert free radicals into stable products. In the initial adhesion process, PMN adhere to the endothelium so that PMN ables to exit the endothelial transmigration as it is called an acute inflammatory process.[19]

This phase continues as chronic inflammatory cells into the injured area. T lymphocytes which are activated by interaction with macrophages that present antigen fragments on the surface of cells can produce IFN γ. These cytokines may activate macrophages so that macrophages release other cytokines to activate lymphocytes and causes inflammation where there is a focus of both these cells stimulate each other to destroy the antigen.

The next phase is the proliferative phase which involves the proliferation of fibroblasts, collagen synthesis, angiogenesis, granulation tissue formation, and epithelisation.[20] An important first step in this phase is the improvement of microcirculation to supply oxygen and nutrients needed to fill the metabolic needs of tissue repair. Regeneration of new blood vessels (angiogenesis) is stimulated by hypoxic injury condition as well as several growth factors. At the same time, fibroblasts migrate into the wound in response to cytokines and growth factors produced by inflammatory cells, among which are macrophages.[21] That activated macrophages can stimulate growth fators and cytokines on the injured area.[22] TGF-β plays a role in angiogenesis, reepithelisation, and connective tissue regeneration. TGF-β works by activating its receptor on the cell surface and transducing signl on target genes.[23,24] In the injured tissues, extra cellular matrix molecules (ECM) expressed during the process of tissue repair.[25] Those growth factors and molecules play a role in proliferation and migration of fibroblasts so that the process of wound healing can be achieved.

Fibroblasts are actively moving from the tissue around the wound into the wound area, proliferate and issue some substances such as collagen, elastin, hyaluronic acid, fibronectin, and proteoglycans that play a role in forming new tissue. Collagen is a protein substance that increase the surface tension of the wound.[20] Increase amount of collagen density that add strength to the wound.[21]

Conclusions

The gel of dragon fruit (*Hylocereuspolyrhizus*) peel extract 30% could enhance wound healing process after tooth extraction of *Wistar* rat (*Rattusnorvegicus),* by increasing of collagen fibers density.

Conflict of Interests: The authors declare that they have no competing interests.

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Guided Group Investigation, Scaffolding Task Questions and Self-Efficacy in Learning to Solve Social Problems in Inclusive Schools

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Abstract

This study aims to examine the effect of guided investigation group scaffolding questions and assignments on improving learning outcomes in solving social problems in Indonesian inclusive schools. It used a quasi-experimental design and took inclusive junior high school students in Surabaya Indonesia. It used test results and inventory self-efficacy. Data were analyzed using two-way ANOVA. The results showed that the learning outcomes of social problem solving students who studied with guided investigation group scaffolding questions and assignments increased more than students who studied with un guided investigation groups, self efficacy significantly affected the increase in social problem solving learning outcomes, students with high self efficacy learning outcomes are higher than students with low self efficacy, there is an interaction between learning strategies with self efficacy in improving the results of learning social problem solving.

Keywords: *Guided group investigation, task question scaffolding, self efficacy, social problem solving.*

Introduction

Currently, most teachers still rely on textbooks in learning and utilize it as the main source material that must be taught, although sometimes the material presented in the book is not appropriate, it is also not in accordance with the environment of students, some teachers also rarely use problems that exist in everyday social life as a source of learning, students are not given the opportunity to construct knowledge so that learning more often memorizes and the results are less meaningful including learning to solve social problems in social science subject matter.

The success of a learning goal is to train students to use their abilities and intellectual skills to solve problems in life, including social problems in social science subject matter that can be measured from several indicators. According to Johnson(1), indicators of problem solving are formulating and identifying problems, evaluating problems, analyzing and formulating solutions to solve problems, determining the most appropriate solutions, and drawing conclusions.

In the 21st century, various models, strategies, learning method have been developed to keep up with the progress of science and technology and changes in social contexts. It also aims at making it easier for students to construct knowledge and learn about problem solving, including solving social problems in social sciences. The learning strategies include the guided group investigation by scaffolding questions and tasks that encourage students to work and communicate with each other through groups to investigate topics or problems that are studied or resolved.

Problem solving learning is essential in order to encourage students' ability improvement to apply knowledge and experience and work in groups to solve problems faced (2). Problem solving has become an

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important cognitive activity in teaching and learning[3]. Problem solving learning in class is useful to evaluate problems and problem solving processes[4]. Problem solving and examples can increase the acquisition of cognitive skills and ability to solve problems independently[5]. The development of problem solving skills is very important in order to succeed in performing various tasks in regulating formal activities (eg schools and jobs) and informal activities (eg activities at home)[6]. Learning about solving important problems in order to be able to show confidence and views on ideas [7]. The application of problem solving interventions based on cognitive strategy instruction succeeded in improving student problem solving performance [8].

Group investigation is a learning strategy that improve student learning outcomes and other aspects. This is in accordance with previous relevant research, including research conducted by Sharan[9], that group investigation as a cooperative learning method guides students to apply cooperative learning skills to planning what they want to learn and how to learn, students work together in doing investigation, planning and integrating and presenting investigative findings also collaborates in evaluating students' academic and interpersonal efforts, giving responsibility for learning to students. But, the teacher must prepare and facilitate project investigations conducted by students. Students' learning ability is significantly higher after group learning[10], group investigations to improve learning outcomes are carried out based on differences in student interests and achievements[11].

Scaffolding is a teaching strategy derived from Lev Vygotsky's socio-cultural theory which is related to the zone of proximal development, describing the distance between what individuals can achieve and what they can achieve with help from others. Scaffolding is temporary support received by individuals from other people who are more knowledgeable during their development[12]. Social interaction is the most important factor to improve cognitive development[13]. Scaffolding is assistance to individuals in the early stages of learning, then reducing the assistance and providing opportunities for responsibility when individuals can do independently. Scaffolding is beneficial for students, for instance facilitating the internalization of knowledge to complete tasks, scaffolding of more competent friends or adults will reduce the cognitive burden when students learn individually. Scaffolding significantly influences cognitive outcomes in problem-based learning[14]. Scaffolding increases students' attention and mastery of the concepts of questions and subject matter so as to improve learning outcomes[15].

Several previous studies related to this present research have affirmed that learning strategy and self-efficacy take a role in influencing students' learning outcomes and students' performance, including learning outcomes and performance of social problem solving. Additionally, it confirm the influence of learning strategies and self efficacy on the outcome of learning social problem solving. Based on the background described above, the purpose of this study is to examine and prove the effect of learning strategies and self efficacy on the outcome of learning social problem solving.

Method

This study was a quasi-pretest-posttest nonequivalent control group design. The influence of the independent variables on the dependent variable was designed using a 2 x 2 factorial design. The subjects of this study were inclusive junior high school students in Surabaya Indonesia, including ordinary students and students with special needs or disabilities. There were two classes or groups chosen randomly and given different treatments. It employed tests which were adapted from Johnson[1]. Self-efficacy inventory was adapted from the scale for the measurement of self-efficacy for learning (SEL) developed by Klobas, Renzi, Nigrelli (16). Data normality test was using Kolmogorov-Smimov technique and variance homogeneity test was using leven's test. Data analysis to test the research hypothesis was using two-way ANOVA with a significance level of 5%.

Results

Hypothesis testing was done to test or prove the effect of learning strategy variables and self efficacy on social problem solving. To obtain the results of hypothesis testing, the research data were analyzed using the two-way Analysis of Varians (Anova) technique. The results of research data analysis with two-way ANOVA based on the 0.05 significance level are presented in table 1.

Table 1: Two-way ANOVA Results Analysis

Tests of Between-Subjects Effects					
Dependent Variable: Social Problem Solving Learning Outcomes					
Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Corrected Model	1410.424	3	470.141	11.508	0.000
Intercept	348985.559	1	348985.559	8542.394	0.000
Guided Group_Investigation	652.360	1	652.360	15.968	0.000
Self_Efficacy	424.907	1	424.907	10.401	0.002
Guided Group_Investigation * Self_Efficacy	407.230	1	407.230	9.968	0.002
Error	2573.762	63	40.853		
Total	358549.500	67			
Corrected Total	3984.187	66			
a. R Squared = .354 (Adjusted R Squared = .323)					

According to the Two-way Anova analysis results, significance rate of learning strategy is 0.000 which is lower than alpha 0.05. It affirms that null hypothesis is rejected. The hypothesis testing indicates a difference of learning outcomes and social problem solving between students learning with guided group investigation scaffolding task quastions and students learning with unguided group investigation. The significance level of self efficacy is 0.002 less than 0.05. It affirms that the null hypothesis (H0) is rejected. The results of testing this hypothesis is that there are differences in learning outcomes for solving social problems between students who have high self efficacy and low self efficacy. The significance level of interaction between learning strategies and self efficacy 0.002, less than 0.05 means that the null hypothesis (H0) is rejected. The results of testing this hypothesis is that there is an interaction between learning strategies and self efficacy that influences the learning outcomes of solving social problems of inclusive school students in Indonesia.

Discussion

Theoretically and empirically, the findings of this study are consistent with the results of previous relevant research, including research conducted by Sangadji[17], indicating that group investigations carried out correctly can improve student learning achievement better. The use of the group investigation model has a positive effect on students' critical thinking skills hence learning outcomes will increase[18]. According to Damini[19]. The positive effects of cooperative investigation group investigation models cause significant changes in student attitudes and teachers and perspectives on cooperative learning and diversity so that learning outcomes are better. The conceptual knowledge and work skills of students using cooperative learning model group investigation types are better than conventional learning[20]. The application of collaborative learning models to group investigations can improve learning process and learning outcomes[21].

Scaffolding offers students the opportunity to internalize knowledge and complete tasks. Scaffolding from more competent friends or adults will reduce the cognitive burden when students learn individually. It improves student performance and the results associated with complex problem solving, developing problem solving, communication, team work, modeling, and professional skills [22]. Scaffolding is an important element for obtaining problem solving skills, improving student performance in problem solving [23]. Scaffolding is effective for improving verbal intelligence and shared mental and sensitivity development and predicting cognitive outcomes of children[24]. Scaffolding correlates with student performance in class interaction, formative evaluation and summative evaluation[25]. Metacognitive scaffolding can be used to increase students' awareness of the process of continuous thinking, planning actions and doing problem solving tasks[26].

The results are relevant to previous findings and theories about the importance of student characteristics including self efficacy to improve learning outcomes, student performance and other student abilities. Student characteristics are learning conditions that influence learning outcomes[27]. According to Degeng[28], to facilitate the acquisition of learning outcomes, organizing and re-disclosure of new knowledge, it is important to consider the characteristics of students. The positive relationship between self-efficacy and performance

fosters optimal performance[29]. Children with high self-efficacy have the ability to participate, effort and future self-success are higher than children with low self-efficacy[30]. Self-efficacy is an individual belief in its ability to achieve the desired level of performance and is very important in education because it affects the personality and attitudes of individuals to achieve better learning outcomes. Self-efficacy mediates a positive relationship between mindset and solution quality and performance originality[31]. Self-efficacy in learning can improve academic performance and significantly improve thinking skills[32]. Self-efficacy helps students to transform motivation into action learning and influences their ability to complete tasks and learning performance, students with high self-efficacy learning outcomes outperform students who are low self-efficacy[33].

The findings in this study also concluded that self efficacy has an influence on increasing learning acquisition, including the acquisition of learning social problem solving. Learning outcomes for solving social problems are more increasing if students have high self efficacy.

Conclusion

Based on research findings, data analysis and discussion, there is a difference in the increase in learning outcomes of social problem solving, learning outcomes of students who learn using the guided investigation group learning strategy with scaffolding task questions than students who learn to use the non-guided investigation group. In addition there are differences in the increase in learning outcomes of social problem solving between students with high self-efficacy than students with low self-efficacy. In addition, it affirms the interaction effect between guided investigation group learning strategies and self efficacy on improving social problem solving learning outcomes.

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Ethical Clearance: We/I, the undersigned researcher(s) have read the Malang State University's Guidelines for Ethical Review of Research Involving Humans and agree to abide by them in the conduct of this research. It is understood that this includes the reporting and monitoring roles associated with the approval by Indonesian Guidance and Counseling Association.

Conflict of Interest: The research being reported in this publication was supported by Malang State University. The author(s) of this publication, has equity ownership in, which is developing products related to the research being reported. The terms of this arrangement have been reviewed and approved by Malang State University in accordance with its policy on objectivity in research.

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Perceptions of Teachers, Parents and Adolescents about HPV, Cervical Cancer and HPV Vaccination

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Abstract

Background: In Indonesia, Human Papilloma virus (HPV) vaccination for children aged 9-13 years has not been widely done for prevention of cervical cancer. Schools contribute to the delivery of information about HPV vaccine. This research aims to explore perceptions of HPV, cervical cancer and the behaviour to ward HPV vaccination among teachers, parents and female adolescents.

Method: This study employed a qualitative design with focus group discussions involving 58 participants. This research was conducted in junior high schools. The inclusion criteria were female students, parents and teachers, while the exclusion criteria were female students have HPV vaccinated. The data was analyzed by content analysis approach.

Results: There were three themes: 1) Limited knowledge about the vulnerability between HPV and cervical cancer, and the lack of familiarity with HPV vaccine, 2) Insufficient insurance and overall cost for HPV vaccination, and 3) Parental involvement in HPV vaccination.

Conclusion: The study showed the importance of HPV-related reproductive health promotion and financial support for increasing HPV vaccination coverage.

Keywords: *Student perception, parent perception, teacher perception, prevention of cervical cancer, HPV vaccination.*

Introduction

The HPV vaccine is expected to prevent up to 70% of HPV incidence in vaccinated females[1]. The HPV vaccination is most effective when administered to 9-13 year-old adolescents and 14-26 year-old non-vaccinated adolescents before they have had sexual intercourse. Recent research shows that the HPV vaccination may achieve a nearly 90% protection rate[2-5].

In Indonesia, the HPV vaccine is available and is still in the initiation process[6]. Low-to middle-income countries face some constraints in introducing the HPV vaccination[4-7]. Parents, health care providers and teachers at school are the main stakeholders in HPV vaccination behaviour for female adolescents in school environment[8-12]. Therefore, this study was undertaken to explore perceptions of HPV, cervical cancer and HPV vaccination among teachers, parents and female adolescents.

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Method

Research Design: A qualitative study with focus group discussions was conducted in Junior High Schools at Special Region of Yogyakarta.

Population and Samples: The samples were divided into three groups composed of 21 students, 17 parents and 20 teachers. Inclusion criteria were: female student with parental approval; parents; and female

teachers. Whereas, exclusion criteria were female students who have HPV vaccinated.

Sample type and selection: We invited female teachers and female students in each Junior High School. We also invited parents who have daughters ineach Junior High School.

Instruments: This study used a focus group discussion technique. It consisted of topics about cervical cancer, HPV, HPV vaccine, how to obtain the HPV vaccine and overcome the barriers.

Data Analysis: Data were first collected and transcribed; second,we confirmed the correctness of data and triangulated the data; third,we read all data or transcripts to find general ideas and other necessary information; fourth, data were thematically coded; fifth, we developed the themes; sixth, we developed the data description and themes in a qualitative narration and; seventh,we interpreted the data[13]. This research was approved by Medical Health Research Ethic Commission, Universitas Gadjah Mada no.KE/FK/1100/EC/2017.

RESULTS

The analysis of the focus group transcript allowed us to identify three main themes related perception about HPV, cervical cancer and HPV vaccination among parents, teachers and female students: 1) Limited knowledge about the vulnerability between HPV and cervical cancer, and the lack of familiarity with HPV vaccine, 2) Insufficient insurance and overall cost for HPV vaccination, and 3) Parental involvement in HPV vaccination. Themes of female students' perception were presented in table 1, teacher's perception in table 2 and teachers' perception in table 3. Female students' mean age was 13,09 years, parents' was 40,6 years and teachers was 44,6 years. Most students from grade VIII (76,2%); 58,9% of parents had a senior high school degree, and 70,6% were housewife. All teachers had a bachelor degree. Most teacher had educational background in life sciences and exact (60%).

Table 1. Themes and categories of female students' perception

Theme 1: Female adolescents' limited knowledge of cervical cancer, and HPV vaccine
Category 1.1: Just heard about HPV
Category 1.2: Do not know about cervical cancer
Category 1.3: Not yet exposed to HPV vaccine
Theme 2: Limited sources of information about HPV, cervical cancer and HPV vaccination
Category 2.1: Family sourced information
Category 2.2: Mass media sourced information
Theme 3: Adolescents' various consideration in taking HPV vaccination
Category 3.1: Parents' cost consideration
Category 3.2: Vaccine's safety and side effect consideration

Table 1 shows that female students just heard for the first time about HPV. Most female students cannot explain about cervical cancer.

R18: "Have heard about HPV but don't know what it is"

R2 & R4: "Haven't heard about it"

R7:"Cervical cancer is inside the womb, right? And it may develop to infertility"

Some exposed information heard by female students are derived from close relatives and electronic media like television.

R7: "Have heard about vaccine from my little sister in elementary school that I am to have cervical injection"

R9: "Have heard about it from TV"

Some female students say that they are willing to have HPV vaccination, but it will depend on their parents, since the vaccine is expensive, while there are many other needs to fulfill.

R6: "*It's expensive. I would prioritize other school necessities which also needs fund*"

R4 & R10: "I'm worried about the vaccine's expiry and side effect".

R19: "It is halal/genuine? There are many frauds in vaccination"

Table 2. Themes and categories of parents' perception

Theme 1: Lack of knowledge of vulnerability to HPV infection with cervical cancer and HPV vaccine
Category 1.1: Do not know about vulnerability to HPV infection with cervical cancer
Category 1.2: Just hear about HPV

Category 1.3: Do not know about HPV vaccine
Theme 2: Parents' socio-cultural limited communication in giving their children sex education
Category 2.1: Lack of confidence in giving sex education
Category 2.2: It is taboo to discuss about sex with children Category 2.3: Afraid of being misused
Theme 3: Parents' cost and concern factor to take HPV vaccination
Category 3.1: Cost consideration to take vaccination
Category 3.2: Concern about safety and effectiveness of HPV vaccine
Theme 4: Parents' involvement to administer vaccination to their female children
Category 4.1: There is no health care program which involves parents Category 4.2: Parents are involved in health care program at school

Table 2 shows that the parents can not explain about cervical cancer and they just heard about HPV vaccine

R6: "Yes, I have heard about it, but do not understand it."

R11: "Have not heard about the vaccine."

R2: "I am alright until now, although I did not take vaccine."

Some parents have not given their daughters sex education since they are deemed too young, and are afraid that they will misuse it, and to talk about sex is something taboo.

R17: "It is taboo to talk about sex, too early, and it is fearful to read it. Get interested but afraid."

R10: "This child is yet incapable of understanding what we convey, thus it is difficult"

R12:"How to communicate it?" Will they understand it"

Some constraints revealed by the parents to take for their daughter vaccination:

R6: "In this village, it is too expensive. It is okay that they do not take it. Thus, I think, it is okay until now that I didn't take vaccination."

R3: "The constraint is the cost. If it does not expensive, or if it is given for free, it is okay." Some of them just realize it and it needs fund, but not all of them are aware of it."

Some parents approve of the HPV vaccination and they want to be involved in the vaccination program for their daughter.

R5: "I just agree, but parents must be involved."

R6: "Is there any for parents at school? What if the health department cooperates with cadre for counseling about it?"

Table 3. Themes and categories of teachers' perception

Theme 1: Limited knowledge of vulnerability to HPV infection with cervical cancer
Theme 2: There are constraints for discussion and giving sex education
Category 2.1: Taboo of sex discussion
Category 2.2: Difficulty to give sex education
Theme 3: There are considerations ofhealth belief
Category 3.1: Vaccine's halal consideration
Category 3.2: Religious consideration
Theme 4: Parents' involvement for female adolescents to take vaccination
Category 4.1: Parents' lack of awareness of health
Category 4.2: Giving parents information of vaccination
Theme 5: Limited fund and health insurance to take HPV vaccination
Category 5.1: HPV vaccination has not been taken as a Government's program
Category 5.2: Vaccination costs too high
Category 5.3: Reproduction health has not become the main concern at school

Table 3 shows the teachers can not explain about HPV and HPV vaccination:

R1:"I just know about it in the subject, since reproduction system is given at grade 9, titled reproduction organs for health. And what the parents previously asked is HPV, about genital wart, and condylomataacuminata."

R2 "just heard about HPV today.

R9:"Cervical cancer is a further development for untreated sexually transmitted disease, which leads to cervical cancer or other reproduction disease"

Some teachers state that it is difficult to give HPV vaccination at school because of parent's social economy. In addition, vaccine safety factors are considered in taking vaccination.

R20: "(Parents'social economy) low, as seen from their education and from their employment, 50% of them are the poor."

R9: "No one dares to take it, it is not allowed since it is not from the government, and the fund may be unavailable yet.'

R14: "In case of health, it is about awareness. It is about how it is prioritized, but it is okay for tour study

The teachers also feel the constraints to discuss and teach about sex education to the students:

R1: "It is to introduce to them the disease, but we find it difficult to convey it. It is a big dilemma, but must be conveyed, but how. The warts seem to be like in general, but with its location on genital organ.

R5: "Let me think about it. I don't know it well, about the science."

In relation to HPV vaccination for female adolescents, some teachers stated about parent's involvement.

R13: "Thus, besides socialization, there is also one by the principal proposed in the meeting between parents and the committee, and the parents must be informed in case the students do not understand."

R11: "I think a detailed explanation is needed of the dangers, and what to do next. Maybe many will be interested, including the parents."

discussion

The research results show that the female adolescent, parents and teachers have limited knowledge of vulnerability to HPV infection, cervical cancer and HPV vaccination. This finding is also supported by other researches that found female students, parents and teachers find it difficult to explain about cervical cancer and its causes[14-17]. Female students, parents and teachers also are not exposed to HPV vaccine and the benefits of the vaccine itself. Other research conclusions support this finding that most of mothers and their daughters just hear about HPV, do not know about the benefit of HPV vaccine and there is limited recommendation for the schedule of HPV vaccine[16].

The parental factor is one factor that influences their daughters to not take the HPV vaccine as the result of a lack of sufficient knowledge of HPV, cervical cancer and the importance of the HPV vaccine for health[18-20]. Parents' education and income can be reasons for this consideration. Additionally, their concerns about vaccine efficacy and safety seemed to be associated with their perception that the HPV vaccine had neither been promote in Indonesia nor recommended by their health provider. Provider recommendation is a factor that influences vaccine decision[21]. The teachers said that the HPV vaccination has not been taken as a Government's program. The interview results with the local Community Health Center also showed that HPV vaccinations have not been considered as the Government's program in the prevention of cervical cancer, while the Government has just promoted early detection through visual inspection with acetic acid (VIA)or Pap smear in prevention of cervical cancer. Although, HPV vaccine is very important, but it is not supported with activities which should be made available at the level of primary health services.

In Indonesia, the people lack knowledge about the HPV vaccination due to lack of socialization of the Government's HPV vaccine program. HPV vaccine is not yet considered as the Government program and it is not the community health center's policy to socialize it through caring for teenagers (PKPR). The PKPR program under the community health centers is currently in the form of a mature marriage program, which discusses about early introduction to sex, sexually transmitted disease, HIV and anemia.

In some developing countries, HPV vaccine is also not yet included into the available national health insurance. Without health insurance coverage for HPV vaccination, parents will not be able to afford it[15]. The parents also stated that their willingness to pay for vaccines is low if its price is too expensive, and they expect that the Government will give this vaccination for free or at an affordable price[22]. This isdifferent fromthe developed countries, where the HPV vaccine program has been included into school programs[8]. The interview results with community health center officer confirm this opinion, indicating that they will not offer an HPVvaccine program until it is affordable for the community. Education of HPV, cervical cancer and HPV vaccine for adolescents and their parents are quite necessary to improve the coverage of HPV vaccination in developing countries.

Conclusion

Further research should emphasize more on information needed by adolescents and parents in relation to HPV and HPV vaccine as well as explanation about the HPV vaccine funding mechanism to facilitate parents' access to HPV vaccination for their daughters.

Source of Funding: Indonesian Ministry of Research, Technology and Hihger Education for funding this research

Conflict of Interest: The researchers declare no conflict of interest

Ethical Clearance: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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Occupational History as a Predictor of Cognitive Ability in the Elderly

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Abstract

Cognitive ability is important for the elderly to be able to live independently. Many factors influence this ability in elderly, one of them being occupational history. The purpose of this study was to analyze occupational history as a cause of decreased cognitive ability. An observational analytic study with a cross-sectional approach. 87 subjects who met the inclusion criteria were recruited from Nursing Homes in Surabaya. 71.3% of the subjects have a history of physical-dominated occupation and 28.7% have intelectual-dominated occupation. There were no differences regarding duration of work and perception of workload in both groups. The average cognitive score is 18.57 (SD 5.939). The ANOVA test between occupational history and cognitive abilities shows p=0.001, R Square=0.172, and estimated standard of error of 5.501. This study concluded that occupational history can be used as a predictor of cognitive ability in elderly.

Keywords: *Cognitive ability, Elderly, MoCA-Ina, Nursing homes, Occupational history.*

Introduction

Health development success in Indonesia has an impact on the increasing number of elderly people. The National Socioeconomic Survey reported that the total number of elderly had reached 22,4 millions in 2016 (equal to 8,695 of the total population). This is indeed an achievement, but along with it are the consequences that arise.[1] Health development effort for eldery has been focused on making them live independently and productive.[2] Better cognitive ability is believed to increase the ability of the elderly to do their daily activities, which in turn can increase their quality of life.[3] Productive is to remain and work to produce something, including living income.

Being old is a normal process, butthe problems with cognitive ability and body strength is the focus on elderly because they can impair information processing in the brain that eventually can affect an individual's social function, work, and daily activities.[4]

There are many risk factors of cognitive ability decline that have been well studied including that of age, gender, race and genetic. Other risk factors associated with lifestyle and diseases were also studied frequently such as hypertension, cardiovascular disease, obesity, diabetes, hyperlipidemia, alcoholism, smoking cigarettes, bad dietary habit, lack of B6, B12, and folic acid and also history of trauma.[5] But occupational history as a risk factor for cognitive impairment is still unclear.

Occupation is a set of activities that takes up most of an individual's time. According to Indonesian Ministry of Manpower, there are 10 categories of occupation.[6] When those ten are categorised based on cognitive function, there are two types of occupation: intelectual-dominated and physical-dominated occupation. The former stimulates the cognitive more than the latter does.

'Use it or lose it' is one of aging theories that is widely used in explaining the brain function. This theory stresses on the neurogenesis of the brain cells: the more they are used, the more developed it would be in terms of information processing.[7]On the contrary, 'wear and tear' theory argues that part of the body which is used repeteadly over time would be more likely to wear out sooner.[8] Based on those two theories, this study aims to find out whether occupational history (occupation category, length of working time and perception of workload) influences the cognitive ability.

Methodology

An analytic observational study using cross-sectional approach. This study was conducted from January to May 2018 at four different nursing homes at surabaya. Using purposive sampling technique and obtained 87 respondents. Respondents over 60 years old and could communicate well as inclusion criteria. Respondents excluded are those who had undergone brain surgery, history of brain injury, parkinson, epilepsy, stroke, hypertension, diabetes, depression, and had a history of a long-term psychotropic drugs use.

The data was collected by interviewing subject using a questionnaire. Cognitive ability was measured using MoCA-Ina.The operational definition of occupational history in this study is a set of activities within a profession on which the respondents spent most of their time for a minimum of five consecutive years. This research is part of the research that has received ethical clearance.

Result

Subject Characteristics

Most of the subject were in the age range of 75-90 years (49 out of 87)while there were only 2 who age more than 90 years. The rest of subjects were in the age range of 60-74. Subject were dominated by female, yielding a total of 57 people. This study found that most of the subjects did not finish high school, thus their education level categorised as low (n=52). Only 4 subject who have bachelor degree.

Occupational History: The description of occupation category is depicted in the diagram below:

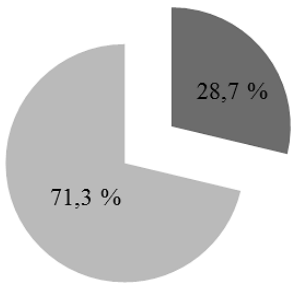

Figure 1. The Subjects Occupational History

Figure 1 showed that most of the subjects had a history of physical-dominated occupation (n=62) whereas fewer of them had an intellectual-dominated occupation (n=25).This study found that the average duration of the physical-dominated work categoryis 20,66 years (SD=10,38) and 18,24 years for the intellectual-dominated work category (SD=8,28). The statistical test showed no significant difference between the two categories (*p=.407*).

Similarly, no difference was found regarding the workload perception between the physical-dominated work group and intellectual-dominated group. 74,2% of the former group perceived their workload as 'moderate' and80,0% of the latter also perceived their workload as 'moderate'.

Table 1. Perception of Workload

Perception of Workload	Intelectual-dominated		Physical-dominated		P=
	n	%	n	%	
Easy	6	9,7	4	16,0	
Moderate	46	74,2	20	80,0	.114
Hard	10	16,1	1	4,0	

The tabel showed no difference on the perception of workload in both groups.

Cognitive Function: The data showed that cognitive function of 73 subject was impaired, indicated that only 14 of them had normal cognitive function.The average score for cognitive function is 18.57 (SD=5,939). Based on each cognitive domain, it was indicated that most of the subjects suffered an impairment of visuoconstruction (n=78), language (n=71) and memory (n=71). The data for each domain is elaborated as follows:

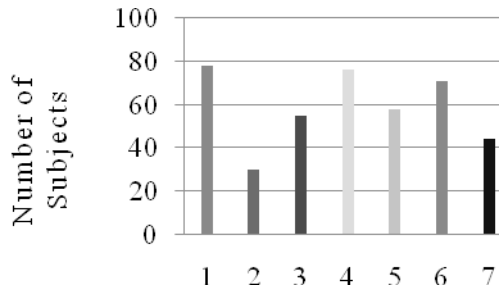

Figure 2. Percentage of Each Domain for Cognitive Function: (1) Visuoconstruction, (2) Naming, (3) Attention, (4) Language, (5) Abstract Thinking, (6) Memory, (7) Orientation

Analysis: The percentage of subjects whose normal cognitive function was higher in the intelectual-dominated work compared to the physical-dominated work. The result duration of work showed no difference between the groups. The percentage of subjects whose

impaired cognitive is range from 73,3%-86,7% in all category of work length.

Regarding the perception of workload, it appeared that the more the subjects perceive their work as 'hard', the more likely it is for their cognitive function to diminish.Despite this, data showed that even when the subjects perceive their work as 'easy', the percentage of those who had impairment of cognitive had already reached 80,0%. The details are shown below:

Table 2. Analysis Between Occupational History and CognitiveFunction

Occupational History	Cognitive Function		p=
	Impaired (%)	Normal (%)	
Occupation Category			**.000**
Physical-dominated	93,5	6,5	
Intelectual-dominated	60,0	40,0	
Duration of Work			**.069**
≤10 years	85,0	15,0	
11-20years	86,5	13,5	
21-30years	73,3	26,7	
>30years	86,7	13,3	
Perception of Workload			**.824**
Easy	80,0	20,0	
Moderate	83,3	16,7	
Hard	90,9	9,1	

Spearman test showed that there is a positive, strong correlation between occupation category and cognitive function (*p=.001*; *Coef. Corelation 0.383***). No specific correlation was found between occupational history with duration of work and perception of workload, respectively.

Regression test resulted in *R Square* of 172, with estimated standard error of 501. This estimation score is smaller than the standard deviation of cognitive function (SD=5,939),. Therefore, this regression model is an appropriate predictor for cognitive function among the subjects.Anova test produced *p=.001,*which means that occupational history is predictive for cognitive function in this study.However, the *p* value for both duration of work and perceptions of workload are not significant.

Discussion

The most of the subject were female with low education level. This finding is in line with what Boedhi-Darmojo stated in his book which argued that elderly population in Indonesia is dominated by female with 3:1 ratio to men and that their education level is low.[9]This number can be caused the life expectancy of female which is higher than that of male.

Households in Indonesia tend to put their elderly who have physical or psychological limitation into a nursing home. This might explain why in this study, more than half of the subjects age more than 75 years. Eastern families actually have had a long-running culture where their parents or grandparents live together in a house. However, this culture seems to shift nowadays since every adult in the family has to work for their living. Thus, no one left in the house to care for the elderly.[9,10]

There are more subject in this study whose occupational history was physical-dominated than those whose occupation is intellectual-dominated with a ratio of 2,5:1. This might be related with the education level. Physical-dominated work, as the name implies, means that physical work is employed more than the intellectual skill. This category of occupation includes salesman, worker of farm, forestry and fishery, handicraft maker, handyman, army and police. Intellectual-dominated work implies that intellectual skill is utilised more than the physical skill. This category includes professionals, professional assistants, manager, technician, administration worker, tool operator, and engine assembler.[6] Considering the economic condition back when the subject were on their productive years, it is understandable that most of them chose the physical work. This type of work was easier to get since it did not require high level of education.

Research by Won in Gyeonggi-do, Korea, showed that 86,4% of elderly suffered from cognitive impairment. Won's finding is similar with the result of this study which showed that 83,9% of the subject had cognitive impairment.[11]He said that the incidence of cognitive impairment increases as the elderly gets older as well as among elderly who have low education level and low income.[11] Sundariyati's research also found that the prevalence of cognitive problemswas the highest in the 75-90 age range and those who did not accomplish elementary school.[12] Similarly, Karp showed that elderly had a history of occupation with low complexity are more prone to dementia.[13]

High prevalence of cognitive impairment in this study can be explained that human body will experience organ function decline by 1% each year starting from

30 years of age. After an individual reaches the age of 30, 100.000 neuron is estimated to decay each year, gyrus shrinks, and brain mass decreases by ≥10%. Furthermore, lipofuscin deposit increases from the brain fatigue, dendrites of neuron slowly decrease, neurons' RNA vanish along with mitochondria and cytoplasm, inclusion of dialin eosinophil and levy body increase, corpora amylacea forms within brain tissue, and blood supply for the brain decreases.[14] This condition is a decrease in physiological brain organs.

In this study, the highest prevalence of cognitive problems was visuospatial domain, language, and memory. One of diagnostic criteria for Mild Cognitive Impairment is the presence of memory deficit. Therefore, memory is considered as the first cognitive function to impair in a physiologic process of brain ageing. Memory function of 75 years old individual is believed to decrease by 25% comparedto someone who ages 20. In elderly, type of memory which deteriorates is short-term memory, whereas long-term memory tends to stay intact or mildly declines.[15]

The association of Indonesian's neurologists (PERDOSSI) in their book 'Neurobehavior' explained about clinical condition in a frontal circuit of the brain as frontal syndrome – an impairment of attention, language, memory, and visuospatial. According to this explanation, this study believes that the frontal lobe is the first to show impairment in a physiologic decline of cognitive function.[16]

6 out of 10subjects in this study whose work was intellectual-dominated showed impaired cognitive function. This can be due to other risk factors that was not excluded yet in this research such as different age range, different level of education, amount of income, anxiety, smoking, and alcoholism. However, the findings on the intellectual-dominated group are better compared to its counterpart where only 1 out of 15 subjects showed normal cognitive function. The statistical test indicated that there was a strong correlation between occupation category and cognitive function.

PERDOSSI argued that working may accelerate an individual's ageing process, especially for physically demanding work such as farmer or handyman.[16] This argument is reinforced by Monginsidi who stated that school teacher is more likely to prevent cognitive function decline than the farmer.[17]Similarly, Pauran in his study stressed that elderly who is passionate in playing chess exhibited better average score of MoCA-Ina than those who are not playing.[18] It can be construed that the theory 'use it or lose it' was perceptible in Pauran's study. He also added that chess players are more preeminent on domains like visuospatial, memory, attention and language. These functions are performed chiefly by the frontal lobe of the brain.

The results in this study revealed that occupational history can be used as a reference in predicting the cognitive disorder in the future. This argument is supported by Stern who stated that education, intellectual job,behavioural factor and life experience enhance the Cognitive Reserve (CR) in the brain so that the brain may survive from the physiologic and pathologic ageing.[19] CR is one of the brain's ability to recover from any cerebral damage so that the clinical manifestation can be minimalised. CR enables nervous system to perform better efficiency, enhance the system's capacity, and make it compensate better to any expansion of the brain function.

Stern explained that CR is also determined by 'Brain Reserve' (BR). BR is defined as the resilience of the brain or the brain's capability in compensating any damage where it can still function sufficiently. Cerebellum is believed to contribute for BR since it is a structure that stores most of the brain neurons. Brain mass and number of neurons are to be called as cognitive saving capacity. An individual with greater cognitive saving capacity is favored to show mild clinical manifestation of Alzheimer.[20]

As an individual grows older the CR is diminishing. Higher education level, intellectual job, healthy lifestyle, relaxed state of mind, and certain genetic pattern may enhance the CR and BR capacity so that cognitive function may perform better. However, at a certain point of time, this capacity too will eventually runs out.[21]

Conclusion

Occupational history, especially the category of occupation, can be used as a predictor of cognitive ability in elderly. Intellectual-dominated occupation category which employs the intellectual skill more showed lower prevalence of cognitive impairment compared to that of the physical-dominated occupation category.

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The Effect of Employment Time with the Low Back Pain Disorders on Workers in the 'X' Carpet Fitting Work Unit Pasuruan

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Abstract

Research Background: Low Back Pain is a musculoskeletal disorder in the lower back area that many complained of patients who visited the doctor. The exact incidence of low back pain in Indonesia varies from 7.6% to 37%. The problem of low back pain on workers is generally influenced by the period of work. Research Objectives: To know the influence of the working period on the low back pain of the employees in the sewing unit of the 'X' carpet factory Pandaan subdistrict, Pasuruan district.

Research Methodology: The research design used in this research is observational analytic with the cross-sectional approach with a big sample of 30 respondents that is patient of low back pain disorder. Data analysis using simple linear regression statistic test $\alpha = 0{,}05$.

Findings: From the result of the significance test of the regression equation got result $p \leq 0{,}05$ so H0 rejected. Thus the regression line equation formed by the function of the effect of the working period with the occurrence of low back pain is significant. In simple linear regression test statistic test the value ($p = 0{,}000$), value ($R = 0.847$).

Discussion: There is significant influence between the working period with low back pain complaints to workers in the sewing unit of 'X' carpet factory Pandaan subdistrict, Pasuruan district.

Keywords: *Worker, Work Period, Low Back Pain.*

Introduction

Low back pain is a pain syndrome that occurs in the lower back region and is a work-related musculoskeletal disorder. The most common causes of LBP are muscle tension or improper posture. Things that can affect the onset of LBP are sitting habits, working bent in a relatively long time, lifting and carrying loads with non-ergonomic attitudes, abnormal spine, or due to certain diseases such as degenerative diseases[1].

In Indonesia, LBP is more often found in the age group of 40 years. Overall, LBP is the most common complaint with a prevalence rate of 49%. However, around 80-90% of those with LBP stated that they did not make any effort to deal with these symptoms. In other words, only about 10-20% of those who seek medical care go to health services[2].

Occupational illness arises because of work relationships or caused by work and work attitudes

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as an example is low back pain [3]. Low Back Pain is a complaint that can reduce human productivity, 50-80% of workers around the world have experienced low back pain so that it has a negative impact on socio-economic conditions with reduced workdays as well as decreased productivity[4]. In 2003, 3.2% of the total US workforce suffered a loss of productive time due to low back pain [5].

In 2012, the prevalence of lower back pain in the past year was 15% to 20%, as many as 90% of cases of back pain were caused by errors in body position in work, such as work attitude in sewing activities.[6]

The profession as a tailor will face the risk of work. According to OSHA in the work of tailors have a variety of risks, namely the risks posed by work designs in sewing work for example: chair design, sewing table design, and sewing table pedals. Tailors have the risk of getting work-related musculokeletal disorders, related to body postures that occur in daily work activities.

Pandaan X Carpet Factory Is a company engaged in and producing textiles and garments. For the garment consists of departments, from some of them: patter/ marker, cutting, sewing/knitting, finishing, pressing, quality control, packing, and deliveries. Workers at the X Pandaan Carpet Factory, work a day for 8 hours starting at 07.30 to 16.30 and resting at 12.00 - 13.00. Within a week they work for 6 days and 1 day off. During their work they are sitting and bending when operating a sewing machine. The majority of workers in the factory have tenure of over 5 years and above. Implementation of work that is not in accordance with ergonomic rules causes complaints of low back pain and affects the performance of workers.

Based on the results of interviews conducted on several female and female workers who experienced pain complaints and complained that they worked in a sitting attitude that was too long. So that the designer's research is to do research on "The Effect of Work Period on Low Back Pain Complaints on Sewing Parts Workers at the X Pandaan Carpet Factory which is engaged in processing East Java carpets.

Material and Method

The type of research used was observational analytic with a cross sectional approach, namely research in which the variables examined, both independent and dependent variables, were simultaneously measured at one time, so there was no follow-up. The independent variable is the period of work. The dependent variable in this study is a complaint of low back pain. The population in this study were 32 carpet factory workers in the sewing unit in Pandaan district, Pasuruan district. Data collection techniques are interviews and observations.

Discussion

Based on research conducted on 32 workers in the Carpet Factory X Pandaan sewing unit, East Java, the results of all respondents were 30 respondents, there were respondents who had a majority working period above 5 years (73%) compared to the lower working period 5 years (27%). Based on the research conducted, the description of the incidence of low back pain disorders in workers in sewing work units at carpet factories 'X' Kec. Pandaan. Kab. Pasuruan obtained total data of all employees of 30 respondents. The description of the events at the research site is seen from the severity divided into 2 categories, namely low risk and high risk. Where the higher the working period of the worker, the higher the severity of the low back pain disorder. In the results obtained from the data of respondents as many as 21 respondents were in a high risk condition indicated by complaints felt by respondents is a sense of pressure and anxiety when doing physical activities both daily and at work. This is caused by several factors, namely age, work period, and work activities when doing work activities at the factory. Factors that can influence the occurrence of low back pain disorders are age. The results obtained from resonden data are from 30 respondents aged 40-50 years being the largest group with 12 respondents (40%), 31-40 years as many as 8 respondents (27%) 21-30 years as many as 7 respondents (23%), and above 50 years as many as 3 respondents (10%). Based on the results obtained, 23 respondents who

Simple linear regression test results in the table below:

No.	Event	Frequency	Percentage
1	Low Back Pain	30 Respondents	100%
2	High Risk of Acute Low Back Pain	21 Respondents	70%
3	Acute Low Risk Low Back Pain	9 Respondents	30%

The results of a simple linear regression analysis using SPSS version 21 for windows were obtained in the form of a significance value of 0,000 <0,05, from the significance value, from the value it was understood that there was a significant effect. Obtained linear regression

equation: $\hat{Y} = A + BX$ Becomes: Work Period = 77,968 + 6,690 low back pain. So, if the work period of a worker has increased by 1 unit, then complaints of low back pain will increase by 6,690 units.

Conclusion

Based on the results of research that has been done on the effect of working period on complaints of low back pain in unie workers working in the X Pandaan Carpet Factory in East Java, the results show there is an influence between Work Period and Low Back Pain interference in workers in carpet factory sewing units' X 'kec. Pandaan. Kab. Pasuruan. From the results of the test of the significance of the regression equation, the results obtained $p \leq 0.05$ so that H0 is rejected. So that the regression line equation formed by the function of the influence of the working period on the occurrence of low back pain is significant. In the results of a simple linear regression test the value is obtained (p = 0,000), the value (R = 0.847).

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Lived Body Principle of a Nurse's Experience in Emergency Treatment at Remote Area Kokonao, Papua, Indonesia

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Abstract

Introduction: Medical service at remote places, far from complete medical facilities, provides different challenges for medical workers, especially nurse, they need to prepare themselves both physically and mentally to get their job done properly. By any limitation, it is needed a tough medical worker.

Objective: It is to explore the meaning of physical and mental experiences (lived body) of a medical worker in committing emergency treatment at remote place, Kokanao, Western Mimika, Papua.

Method: The method are qualitative by using phenomenology interpretative approach and Van Manen data analysis.

Results: The emerging themes based on lived body principle are two: physical difficulties in facing limited nature conditions and society's cultures and mental fatigue in facing negative action of society.

Conclusion: A nurse commences task at remote place, especially Kokonao, Papua, Indonesia, experienced both physical and mental abuses. Any faced limitation at remote place will not hinder them to unlimitedly serve.

Keyword: *Nurse, Remote area, Lived body, Emergency Treatment.*

Introduction

Papua is the largest island, located eastern area of Indonesia. As a large island, the numbers of its people is still a few. The data of Central Bureau Statistics[1], about 57.49% of Indonesian people live in Java and Madura islands, with are only 6.96% of whole land large of Indonesia about 5.8% from the number of Indonesian people. Papua, with area 22.83% of Indonesia, is inhabited by less than 2% of Indonesian people. Papua attracts world's attention related to health problem. Low health levels of Papua cover four matters, such as mother-kid health and nutrition of society, infectious disease – malaria, tuberculosis (TB), and HIV – Aids. Besides that, due to its area, Papua is surrounded by complete and various environmental conditions, started from natural mountains and resourceful shores, making Papua as full of potential place. However, variety and topography resources of Papua have their own difficulties of health service development in Papua. The people randomly inhabit on mountains, shore, or even valley, entailed by strong local custom about social life and belief, cause field of health cannot develop and grow[2].

Based on previous studies done in July 2018, it was gained result in Western Mimika district, Kokanao, Mimika Regency, Papua, in which is research location – a remote place inside of shore. This district has inhabitants about 2215 people and only has one main health center with distribution of medical workers only consists of 1 doctor, 12 nurses, 5 midwiferies and one analyst. The transportation is only able to reach Western Mimika district from the center of the regency via air (airplane) twice a week and via river (boat) with distance coverage 4-6 hours[3]. Emergency services at remote place is proven difficult due to limitation of facility and equipment. Besides that, doctor who is not always in the house becomes a problem in giving service. The absence of doctor when there is an emergence causes the nurses to be less confident in giving service.

In this phenomenology study, people is seen

holistically and acknowledged their existence in interacting with themselves, other people, or to surrounding environment[4]. Initial statement developed by this phenomenological study is what most essential thing can be taken from an individual human life and what it means. According to Marleau Ponty (5), four aspects of human life experience to be investigated are lived space/spatiality, lived body/corporeality, lived time/temporality, and lived human relation/relationship. Lived body means reality where human lives physically in this world. The existence of physics reveals something about ourselves and hides something at the same time. Lived body includes emotional, psychology, and physiology dimensions.

Method

The method is qualitative with phenomenological-interpretative approached developed by Heidegger in 1962. Philosophy followed by Heidegger is not only human life description but it emphasizes on understanding and interpretation(4). Sample selection is done by using purposive sampling after meeting determined inclusive criteria. There are six nurses whom actively willing to involve. Data collection is done by using *in-depth interview*. This research uses Van Manen data analysis because the method can represent interpretive and hermeneutic phenomenology research design(4).

Findings: Thematic aspect, such as mental or psychological meaning of experience, can be found separated from description of participants' experiences by using 3 method: The detailed or line-by-line approach, allows researcher to carefully read and analyze each sentence to find the essence or meaning of participants' experiences. The selective or highlighting approach, allows researcher to highlight or express statement of phrases in which are considered important and interesting from the investigated experiences. The holistic approach, allows researcher to see the whole text and try to find the meaning from the text. The findings of analysis of six participants related to lived body toward nurses' experiences to provide emergency treatment at remote places, Kokanao, get these three themes:

Physical Difficulties to Face Limitations of Natural Condition and Local Custom

This theme is built up from those two subthemes: life limitation at remote places and physical abuse experience while doing task. Life limitation at remote place can be grouped into several categories: takingto patients' problems of tidal wave, absence of electricity at remote health care, uncomfortable place of health workers' living places, bringing personal meals from city, having difficulty to get clean water, taking patients by rowing boat, being difficult to get transportation into remote places, having communication difficulties at remote place. Those categories describe difficulties experienced by the nurses while doing their tasks at remote place. Here are statements of the participants stating difficulties physically at remote places:

"the lights (electricity) have not been provided since last year"(p4)

"With the numbers of the workers and seen from their houses which are not well appropriate"(p4)

"for drinking, I need to buy water. Then to take a bath, no matter how I like or dislike it, I need to use that salty water. It feels itchy and slimy" (p5)

The participants also experienced physical abuse while doing their tasks. The abuse is punching done by family of the patient and causes one of the parents of the participants get injured as stated below:

"they were coming to my house. I was punched by using log when there was an infusion attached to me, luckily there was my mom defending me. Then, my mom got injured. It is my experience being punched by patient"(p1)

Mental Fatigue while Facing Negative Actions of the Society: Mental fatigue in English is known as tiredness not only physically but also mentally. This fatigue is feeling of being overwhelmed or emotionally drained continuously. This theme appears from several subthemes faced by participants, such as: experiencing verbal abuse and threat while doing emergency task at remote place. The verbal abuses are experienced while the participants get vituperation and becoming a target of impingement of patient's anger because the patients does not satisfy with the service. Meanwhile, threat is in the form of terror which makes participants afraid or frightened. Here are the statements:

"(patient's family) they only get angry to us (nurses)"(p3)

"I even ever threated to be punched by patient's family. Even they sometimes came to my house and terrorized to make us afraid" (p1)

Subthemes of feeling not appreciated by patients and their family. This feeling appears as disappointment of the participants after struggling so hard to help the patients from emergency state but they got threats and harmful reaction from patients' families. The participants below say:

"If it is about angry, yes it is. Since we had helped to provide services without thinking the risk upon us but they inappropriately repay us so" (p2)

The difficulties and fatigue mentally are also experienced by nurses of the remote area could be also triggered by social relationship. It deals with the participants' feelings when they needed to leave their families at town. Here are the statements:

"what else can I do? I am sad because I lost contact (communication) to my family" (p1)

"Each time I need to go to the remote place, I feel so sad, so burden to go there (the remote place). First thing first, I need to leave my family in Timika" (p5)

Problems related to working environment where the nurses do their tasks may cause mental fatigue. One of them is inappropriateness of the nurses' education to their responsibility at remote places, different treatment experienced by the nurses whom majorly are civil servants, unclear health care management will lead to mental fatigue of the nurses.

"May be, whom feeling like this (recklessly working) because he is a civil servant. So he can do anything up to him to come and go from Timika. And he has juniors whom are not civil servants, so it do not bother him" (p1)

"surely the management of remote area health care has not been well organized" (p4)

Emergency treatment at remote place insists nurses to do several actions which are not their authorities. It is done only to save patients so medical action which should have been done by doctor must be done by them when the doctor is absence. It makes them afraid and worried for nurses since they feel threatened to get punishment when they breach the authority.

"actually, I feel afraid to do that treatment (medical treatment without doctor's presence) if they patient do not recover, the family will get angry and we will be blamed again" (p6)

Self-Reflecting: This theme is built from three subthemes, started from thinking about self-limited ability. The participants introspect themselves dealing with their abilities to provide emergency state service. Here are the statements:

"Later, after finishing the treatment, I will sit and think what I have done to the patient? May he be saved? Will he or his family get angry? I do this to his family? Yeah, those are feelings I need to forget. The most important is to do it"(p1)

Besides questioning their own abilities while committing the services, the participants also think remote condition when it is left, they will feel guilty when they go home and leave the remote place.

"I am feeling guilty but I will not go home for long. It is just a moment. Ummm I feel guilty for not servicing the patients (working). So, I need to go back there" (p3)

Embracing on professional pledge becomes the subsequent subtheme, the participants try to keep working because they remember their pledge when they were graduated.

"I am feeling guilty but we have pledged when we graduated anywhere we are deployed we must serve them with heart although they are angry they are our patients and we need to keep servicing them" (p6)

Discussion

Physical difficulty contextually in this research is when the nurses get difficulty which has influences their physical condition. This difficulty is experienced by participants in physical difficulty theme takes form such as physical abuse done by patients or their families. It is such as punching, triggered by various sources, one of them is feeling not satisfied toward the given service. This finding is in line with Shields and Wilkins[6] study. It reveals that most of the patients in Canada got physical and emotional abuse by the patients. It is caused because of poor working climate. It is included sufficient employments and sources, and also poor interpersonal relationship among health and medical workers. Shield and Wilkins[6] also says this study provides evidence of a relationship between physical violence from a patient and errors in the provision of nursing care. This shows that the role of nurses in providing nursing care can be compromised as a consequence of the violence. This statement was in accordance with what was experienced

by one participant while carrying out an assignment in the remote area Kokonao, where the participant was beaten from the patient's family because of a misunderstanding in which participants were suspected of not carrying out their duties properly.

Subsequent physical difficulty happens on the participants is about limitation they experience dealing with their own social own life at remote area. Health care center which has been providing medical service, does not have any electricity so it makes the participants difficult to provide better services when the patients come at night. Emergency state service in low-light places will make medical services cannot be maximized and caused the participants have physical difficulty visually. At remote area of Kokonao also provides opportunity for participants in taking patient process where they need to take boat through the river or seas for 4-5 hours which causes physical fatigue for both patients and the nurses.

The theme – mental fatigue – contextually in this research means psychological and mental conditions of participants whom are shocked due to actions of the patients, the patients' family, and society during doing their task. Mental fatigue experienced by participant in this research is caused by many things, one of them is working environment where participants often verbally abused by vituperating and being target of patients' anger due to their dissatisfaction and lack of understanding about the given treatment. It is in line with Dlamini and visser[7] where nurses of their study stated that their working environment are frequently attacked and insulted by patients. It makes the nurses frustrated and lost their pride as nurses. Although unavailability of sufficient working resources are still expected to be able to solve problems and to be responsible beyond their own role. It causes them to have inappropriate psychological experience. Furthermore, Dlamini and Visser(7) stated that the nurses frequently needed to work out of their job description. According to the nurses, they need to work for whole day and have not sufficient time to rest because their leaves are denied due to lack of staff. It causes fatigue which makes them easily commit mistakes while working. It is in line with categories which create subthemes of the problems in the working environment – that is the participants are not in line with their education and are forced to do some medical action out of their authority for the sake of patients.

The nurses also state that they are disappointed by management of health care center and feel like they are differently treated as non-civil servants. The participants also tell that they used their own money with expectation to get some replaced money after taking the patients but they did not get it. It causes them to get disappointed by the management. This finding is in line with Dlamini and Visser(7). In their study, the nurses stated that they are disappointed by management, especially when it deals about their wellbeing. They described that the nurses were disappointed as impacts of unfair action upon them from the management. The nurses in this research often faced challenges about their psychological wellbeing which is not respected and acknowledged as professional worker.

Self-reflection of what participants have done in this research as results of worry and their thought while finding many difficulties in providing emergency state service at remote area. The participants found that their knowledge and skills are still limited so it leads to anxiety while providing treatment action or medical action. The nurses struggle to find and think again what they could use and fix to provide better service.

Bertero(8) stated that nurses reflected their relationship to patients and close family, their interaction to patients and close family, providing needs and feeling frustrated. They identified and described the situation, realizing their feeling, evaluating the situations and creating some analysis and thought if they can act more quickly with other actions. It is in line with what participants show in the subthemes by evaluating their own limited abilities while providing service and thinking remote place condition when they leave it to go home. Findings of Bertero[8] also shows that reflection in nursery practices can be identified as action reflection, reflection inside of action and reflection as self-discovery. Sometimes, the nurses intuitively do their jobs. They do it according to their experience which is considered to be functional. However, they sometime get difficulties to express it. In another word, they have what is said to be silent knowledge. Reflection as self-discovery, in line to what participants experienced in the subthemes, is adamant to commit their professional pledge where the participants must keep working to society although they get inappropriate reaction. They found themselves as persons to commit their own professional pledge they said after graduation.

Conclusion

Live body principle from four existential phenomenology on the nurses' experiences in providing

emergency state service at remote place, Kokonao, Papua result to physical difficulty theme to face limited natural condition and social cultures, mental fatigue to face negative reaction of the society, and then to do self-reflection. Those three themes appear because many limitation they faced in providing emergency state treatment. The limitation is not only from facility but also social cultures of the remote place.

Conflict of Interest: None

Ethical Clearance: This study has passed ethical test at University of Halu Oleo, Kendari, Southern-East Sulawesi, with reliability number of ethical code reliability 2504/UN29.20/PPM/2018.

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Biliary Atresia Outcome in Egypt: A Descriptive Study

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Abstract

Biliary atresia is a rare disease that affects children and neonates, nowadays the current management of BA is portoenterostomy with or without liver transplantation, in this study we described the outcome of BA in single center .

We included 48 patients in this study with type 3 BA and measured the incidence of clearance of jaundice and cholangitis the incidence of clearance of jaundice was 43% and cholangitis was 20% also the mean age was 74.6±21.8 days which is quiet high.

We concluded that early diagnosis and centralization is the key point for getting best outcome for patients of BA.

Keywords: *Biliary Atresia, Porto entersostomy, Jaundice clearance, cholangitis.*

Introduction

BA is an obstructive cholangiopathy, an inflammatory process that affects both intra and extra hepatic bile ducts causing obliteration of the bile ducts ends up to cirrhosis and liver cell failure if left untreated(1).

Although it is an uncommon disease occurring in 1/10000- 1/15000 live births world wide it It is rare but with obvious geographical variation as in Europe and North American for example it has an incidence of 1 in 15–,20,000 live births and by contrast can be seen in up to 1 in 5000 live births in Taiwan and presumably mainland China. It is not a homogenous, uniform disease and within the umbrella term are several variants which have separate and distinct causes and different outcomes. These make comparison of treatment options difficult but not impossible(2).

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The etiology of BA I unknown but thought to be multifactorial, currently there is 3 main types of BA; cystic type of BA, isolated BA and syndromic BA which is thought to be congenital in nature(3).

The first porto enterostomy was done by Prof Moro Kasai 1953 by chance while he was dissecting in the porta hepatis and noted bleeding then he put the dudenum for hemostatsis then the patients stool got coloured since then many modifications has been done to this operation and became the first line of treatment of BA with or without liver transplantation(4).

There are many factors that affects the outcome of Kasai procedure, the most important factor is patients age at time of operation, the second is the type of BA the best in prognosis is cystic type of BA while the worst is the syndromic BA, attacks of cholangitis also affects the outcome also adjuvant therapy may play a role in improving the outcome(3).

The prognosis of BA has dramatically changed in the last decades: before the Kasai operation most BA patients died, while nowadays with the sequential treatment with Kasai operation, with or without liver transplantation, BA patient survival is close to 90%. Early diagnosis is very important since the chances of success of the Kasai procedure decrease with time(5).

In Egypt and due to limitation of liver transplant in patient with BA below one year of age we have to do our best to increase the success rate of the porto- enterostomy in patient with BA including both clearance of jaundice and the percentage of native liver survival

Patients and Method

48 patients were included in this trial we included all cases of BA type 3 after investigations were done including Lab investigations which showed direct hyper bilirubinemia, elevated GGt and Alkaline phosphatase,ultrasound showed absent or non contractile gall bladder, liver biopsy showed marked inflammation and bile duct proliferation .

All cases were operated and managed at Cairo University Children Hospital (CUPSH) and after referral to the surgical department the case is admitted 48 hours before surgery and preoperative labs were done, blood crossmatching and preoperative antibiotics were given .

On the OR patients were anasthesized supine with endotracheal intubation and sonar guided CVL .

The infant was positioned supine to ensure a non obstructed view for cholangiography,which was not routinely required .surgical exploration commenced through an extended kocher`s incision centered to the right ..this incision could be extended across the midline if biliary reconstruction was required . he the left upper quadrant was examined to determine splenic anatomy .

Liver consistency was noted and the porta hepatis inspected.. Cholangiography has a distinct role in this patients.

If the gallbladder had a lumen, diluted contrast material (diatrizoate Hypaque) was injected to determine the continuity of the biliary tree between the liver and duodenum. Complete extrahepatic duct patency was confirmed when contrast appears distally in the duodenum and proximally in the liver radicles. The size of the ducts is assessed by cholangiography to determine whether biliary hypoplasia or obstruction to bile flow from inspissation was present. If the contrast material moved only distally into the duodenum and not into the liver, gently occluding the distal common bile duct while reinjecting the gallbladder to encourage proximal ductal filling, although this maneuver rarely succeeded. If extrahepatic biliary patency is demonstrated, regardless of whether the ducts were of normal caliber or diminutive, a liver biopsy is performed and the incision closed.

If ductal patency was not confirmed, portal dissection and biliary reconstruction was performed (the Kasai procedure).

According delivery of the liver some surgeons preferred to deliver the both lobes of the liver from the abdominal cavity after dividing both triangular ligaments, some preferred to deliver the left lobe only and minority prefer not to deliver either lobes and doing the portoenterostomy insitu.

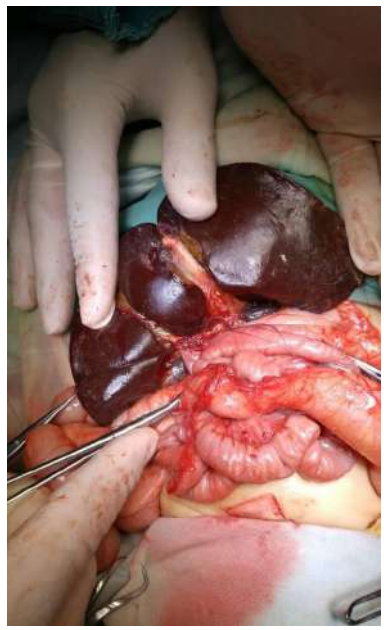

Figure 1: Liver delivery before dissection

The fibrous common duct was ligated distally with nonabsorbable suture and transected. Gentle traction applied to the remnant facilitates dissection toward the porta, where a cone of fibrous tissue anterior to the bifurcating portal vein is encountered.

When there was discontinuity of the biliary tree, exploration of the tissue overlying the portal vein bifurcation will almost invariably reveal the fibrous cone. Placing a suture in this fibrous tissue will facilitate establishing the plane above the portal vein.

Once dissection was complete, fine stay sutures were placed at the lateral margins of the fibrous cone. While maintaining moderate tension, the fibrous cone was sharply transected,

The resected biliary structures with attached gallbladder remnant are sent for pathologist to measure

the size of the biliary ductules for later prognostic evaluation.

Recently we standardized our technique by making wide portal plate extending from Rex fossa to the gall bladder fossa (innominate fossa) for allowing maximum drainage of bile through the porto-enterostomy .

The porto-enterostomy was done retro colic through an incision in the transverse mesocolon just to the right of the middle colic artery.

The prto-enterostomy was done end to side by making an incision of the anti-mesentric border of the roux limb 1-2 cm of its distal end to avoid blind pouch and then the anastomosis is done using parachuting technique for the posterior wall which allows better vision.

After completing the porto-enterostomy the roux limb was sutured to the glisson`s capsule and transverse meso colon to decrease the tension on anastomosis.

Drain was usually inserted and removed on the 5th day post operative.

Regional anaesthesia (TAP block) is injected at the lateral border of rectus sheath to decrease postoperative pain, the dose was calculated through the anesthesia team.

Abdomen was closed in 2 layers and Subcuticular closure for the skin was done.

Postoperative Management: Patient was kept on the ICU on nasal oxygen if needed with proper analgesia, Iv fluids and post operative CBC was done routinely to detect any need for blood transfusion.

Gradual feeding was introduced once intestinal motility was regained

Patient was followed up through CBC with differential and CRP to detect early sepsis and upgrade antibiotic line accordingly.

Discharge: Patients was discharged when they reached their full feeding with no fever and no laboratory signs of sepsis.

Outpatient follow up: After discharge Patients were followed up regularly at the hepatology clinic for follow up.

At day 12 post operative, 1,3 and 6 months postoperative.

General medical examination was done, jaundice is detected recording of any complication such as cholangitis, etc.

The following data were recorded: Hepato splenomegaly, Presence of jaundice, Colour of stool, Fever and cholangitis.

Results

Concerning our patients the range of age was **(30-118)** with a mean age was **74.6±21.8** . 25 were males (52%) while 23 were females (48%)

In our study 25 cases were male (52.1%) and 23 cases were female (47.9 %)

In our study 21 cases (43.8%) were jaundice free within the first 6 months postoperative .

27 cases **(56.3%)** were still jaundiced at 6 months postoperative . 35 cases (72.9%) has coloured stool while only in 13 cases (27.1%) clay coloured stool have persisted.

The median preoperative bilirubin was 9.8 mg/dl while the median bilirubin after 6 months were 5.1 mg/dl.

Discusson

Although our study seems to be intermediate in number of cases and this limits the presence of statistical significance of the data but this happened however this happened due to relatively short duration of the study which was only 2 years, Davenport made his trial over 11 years and the START trial was done over 6 years[(1)].

Concerning age in our study the mean age was74.6±21.8 (30-118), 14 cases were less than 60 days (29.2%),23 cases were 60-90 days (47.9%) and 11 cases were 90-120 days (22.9%).

By comparing the mean age with the mean age of the similar studies that discuss the use of steroids the mean age of this study is the oldest age, in the study of Tyraskis and Davenport 2016 the mean age was reaching 46 days (12-70) days[(1)]. while In the START trial done be Bezzera 2014 the mean age was 69 days[(6)], also at the study of Escobar 2006 the mean age was 43 days[(7)], the mean age of the study of Petersen 2008 was 62 days[(8)]. Chung 2008 also at has a mean age of 70 days[(9)].

From the previous data we can conclude that the youngest age was at Davenport study (45 days (12-70)) and we think that this could be achieved by the centralization system that the NHS provide to allow early detection and management of those cases and due increased awareness of this disease among pediatrician[1].

On the other hand in EGYPT and due to lack of awareness of this disease among pediatrician and due to lack of ability of differentiation between BA and physiological jaundice there is a delay in the management of these cases, In our study we excluded the cases aged above 120 days due to controversy about benefit of porto-enterostomy for those patients and if we didn't exclude those cases the mean age would be much higher .

Conclusion

For achieving best outcome for patients of BA two main factors should be present the first is early diagnosis and management of biliary atresia either by screening or increasing awareness of this disease between pediatricians the second factor is centralization which should increase surgical success.

Ethical Clearance: from ethical committee cairo university 2015 ethical comitte approval number I-111015.

Funding: Self funding

Conflicts of Interests: Nil.

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Improvement of Women's Skills toward their Children with Hemophiliaat Hereditary Blood Disease Center in Al-Nasiriya City, Iraq

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Abstract

Background: Hemophilia refers to a group of bleeding disorders in which there is deficiency in one of the factors necessary for coagulation of blood such as factor VIII, IX or XI. The study was aimed to assess and improve women's skills toward their hemophilic children. Method: A descriptive study was conducted on a sample consisting of (70) women having hemophilic children who were selected randomly from Hereditary Bleeding Disease Center in Nasiriya City, Iraq from June 2018 to November 2018.

Results: The results revealed that differences were found between the study and control groups (P<0.01). With regard to practice of women in post-test, there was significant difference between practice (P<0.01) after the application of the education program in post-test conducts with relative comparison to the pre-test occasion in the study group.

Conclusion: Most of the women in the study group got benefit from implementation of programme about their skills concerning hemophilic disease.

Keywords: *Hemophilia, Practice, Children,Women, educational programme.*

Introduction

Hemophilia is a mostly inherited genetic disorder that impairs the body's ability to make blood clots, a process needed to stop bleeding.[1,2]. As a consequence, people bleed longer after an injury, easy bruising and an increased risk of bleeding inside joints or the brain[3]. Those with a mild case of the disease may have symptoms only after an accident or during surgery[3]. Bleeding into a joint can result in permanent damage, while bleeding in the brain can result in long-term headaches, seizures or a decreased level of consciousness[3].

Method

Non–probability (purposive) sample application was conducted on a sample consisting of (70) women having hemophilic children who were selected from Hereditary Blood Disease Center in Nasiriya City, Iraq. The assessment was conducted from 1st, June until 13th, November 2018.

Results

Table (1) showed the criteria of study groups. The highest percentage of women were within the age range (36-40) years who represented (28.6%) of the total study group, while the control group age range was (26-30) years who represented (28.6%). With regard to the level of education of women, the highest percentage of the study and control groups were primary school graduate who represented 28.60% and 35.20%, respectively. In addition, the majority in the study and control groups were unemployed (65.70% and 71.60%), respectively. In respect to the residential areas, the majority of women in the study and control groups came from rural areas (51.40% and 62.60%), respectively. Moreover, table 2 showed that there was no significant association between

women's skills and their educational level at the pre-test and post-test occasions in the control group. However, there was no significant association between women's skills and their educational level at the pre-test occasion, but there was significant statistical association between women's educational level and their skills at the post-test occasions in the study group**.** Furthermore, table (3) indicated that there was no significant association between women's skills and their occupation at the pre-test occasion, but there was highly significant statistical association between women's occupation and their skills at the post-test occasions in the study group. However, there was no significant association between women's skills and their occupation at pre-test and post-test occasion occasions in the study group.

On the other hand, table (4) indicated that there was no significant association between women's skills and their residential area at the pre-test and post-test occasions in the control group, however, there was no significant association between women's skills and their residential area at the pre-test occasion, but there was highly significant statistical association between residential area and their skill at the post-test occasions in the study group. Also, table (5) showed that there was no significant difference between the pre-test and post-test and follow up 1 and 2 within the group as well as relative to women's skills in the control group. There was significant difference between the pre-test and post-test and follow up 1 and 2 within the group as well as relative to women's skills in the study group.

Table 1: Demographic data of the study population

Variable	Control Group		Study Group	
Age/yr	**No.**	**%**	**No.**	**%**
41-< 45	2	5.70	5	14.3
36-40	8	22.90	10	28.6
31-35	5	14.30	7	20
26-30	10	28.60	7	20
21- 25	6	17.10	1	2.8
≤20	4	11.40	5	14.3
Total	35	100	35	100
Educational Level				
High institute/college graduate	9	25.70	9	25.70
Secondary school graduate	5	14.30	7	20.0
Primary school graduate	11	31.50	10	28.60
Read and Write.	6	17.10	4	11.40
Does not read and write	4	11.40	5	14.30
Total	35	100	35	100
Occupational status				
Unemployed	25	71.60	23	65.70
Employed	10	28.40	12	34.30
Total	35	100	35	100
Residential area				
Rural	18	51.40	22	62.80
Urban	17	48.60	13	37.20
Total	35	100	35	100

Table (2): The association between women's skill and their level of educational

Women Educational Level	Control Group/Skills								Study Group/Skills							
	Pre-test				Post test				Pre-test				Post test			
	1	2	3	*T.	1	2	3	Total	1	2	3	*T.	1	2	3	Total
Does not read and write	118	32	6	156	112	37	7	156	123	55	17	192	5	29	161	192
Readand Write	157	66	12	234	152	68	14	234	89	54	13	156	13	23	120	156
Primary school	237	126	26	390	232	133	25	390	224	30	36	390	11	79	300	390
Secondary school	132	51	11	195	125	57	13	195	178	62	33	273	9	71	193	273
Collegegraduate	241	122	28	390	237	124	29	390	218	107	31	351	6	83	262	351
Total	785	397	83	1265	758	419	88	1365	727	408	130	1265	44	285	936	1265
	$X^2_{obs.} = 9.081$				$X^2_{obs.} = 20.982$ P ≤ 0.05				$X^2_{obs.} = 19.542$ P ≥ 0.05				$X^2_{obs.} = 8.361$			
	X^2 Crit. = 20.190 *P*≥0.05 df = 8								X^2 Crit. = 20.190 df = 8							

Table (3): The association between women's skills and their occupation

Occupation of Women	Control Group/Skills								Study Group/Skills							
	Pre-test				Post test				Pre-test				Post test			
	1	2	3	*T.	1	2	3	Total	1	2	3	*T.	1	2	3	Total
Unemployed	735	196	45	975	969	234	46	975	574	274	45	497	20	177	700	497
Employed	150	201	38	390	162	185	42	390	253	134	85	468	24	108	336	468
Total	885	397	83	1365	858	419	88	1365	827	408	130	1365	44	285	103	1365
	$X^2_{obs.} = 5.661$				$X^2_{obs.} = 5.661$				$X^2_{obs.} = 5.861$ P ≥ 0.05				$X^2_{obs.} = 6.334$			
	X^2 Crit. = 9.210 $P \geq 0.05$ df = 2								X^2 Crit. = 9.210 df = 2							

Table (4): The association between women's skill and their residential area

Women's Residential area	Control Group/Skills								Study Group/Skills							
	Pre-test				Post test				Pre-test				Post test			
	1	2	3	*T.	1	2	3	Total	1	2	3	*T.	1	2	3	Total
Rural	285	189	33	507	276	197	34	507	384	194	85	663	21	128	516	663
Urban	600	208	50	858	582	222	54	858	827	418	130	1365	44	284	103	1365
Total	885	397	83	1365	858	419	88	1365	443	214	45	702	188	159	520	702
	$X^2_{obs.} = 4.655$				$X^2_{obs.} = 4.098$				$X^2_{obs.} = 4.557$ P ≥ 0.05				$X^2_{obs.} = 4.088$			
	X^2 Crit. = 9.210 df = 2 P < 0.05								X^2 Crit. = 9.210 df = 2							

Table (5): Analysis of Variance for differences between pre-test, post-test and follow up 1 and 2

	Study Group				Control Group			
Source of Variation	Sum of Square	Df	Mean Square	F	Sum of Square	Df	Mean Square	F
Between Group	19.371	2	9.686	8.167	30.448	2	5.077	3.408
Within Group	37.952	32	1.186		41.695	32	1.489	
Total	57.323	34			81.143	34		
	F. critical = 5.432 $P \leq 0.05$				F. critical = 5.432 $P \geq 0.05$			

Discussion

Adequate practice has been recognized as a necessary ingredient in women's' ability to lead normal and productive life for their children[6]. The latter found out that women's practice in children with hemophilia care is considered one of the essential tools in raising the standard of hemophilic childcare given by women and nurses. Women must have sound understanding of scientific principles underlying each step of any procedure in order to prevent possible risk factors. So they become able to apply their practice into effective care[7].

HFA[7] indicated that hemophilia is a hereditary disorder of blood clotting mechanism primarily affecting males, being transmitted through unaffected females, while the HFA[8] stated that one quarter to one third of all occurrences appear in families with no previous history of the disorder. This is in agreement with present results were (25.7%) of the study group and (17.1%) of the control group were new cases without family history.

It had been shown that (22.8%) having bruising at age >6 months in the study practice and attitude of mothers in reproductive age about family planning group and (28.6%) having it at age <6 months) in control group (Table 2).

The present study agreed with HFA[9] that indicated the first sign of bleeding problem is likely to occur in nearly infancy when crawling and walking are first attempted, these activities will produce the inevitable knocks and twists and could result in bruises. Moreover,[7] reported that bruises are common, but are usually superficial and not painful. As babies with

hemophilia start to become more mobile, some women like to reassure themselves by padding, the knees of long trousers and sometimes sleeves to protect elbows from bruising and bleeding at baby age usually occurs as a result of a bang or a fall. Superficial bruising is the most common form of bleeding.

Relationship between women's practice with their demographic characteristics in pre- and post-test occasions: It had been found that there were significant differences between women's practice and their age, at pre- and post-test occasions in the study group, while in the control group there were no differences between women's practice and their age, at pre and post-test occasions (Table 2). This meant that women of study and control groups did not experience any information or gained any practice concerning hemophilia when they exposed to the pre-test, besides, this result was in agreement with [11].

Significant difference was noticed between women's practice and pre and post-test occasions in all educational levels in the study group, (Table 2), while in the control group there was no significant difference between women's practice and pre-and post-test occasions in all educational levels (Table 2). This indicated that all women form different educational levels gained practice concerning their children's illness only after the implementation of the educational program in the study group. The present result was consistent with that of [7].

In the present study, the researcher tried to introduce the information and items of the educational program in a simple and clear language. So that to be more appropriate and sufficient for all educational levels of women for better understanding.

Significant difference was found concerning practice in the study group at pre- and post-test occasions for employed and unemployed women (Table 3). That meant both employed and unemployed women experienced significant increase in their practice after implementation of the educational program, while in the control group there was no significant difference relative to women's practice at pre- and post-test occasions in respect to women's occupation (Table 3). The result of [8] indicated that occupational status has significant effect on women's hemophilia practice and their children condition which was in agreement with the finding of the present study. Significant difference was noticed concerning practice at pre- and post-test occasions in the study group in respect to residential area (Table 4)that meant both rural and urban women in the study group had improved their practice after the implementation of the educational program. However, there was no significant difference concerning women's practice at pre- and post-test occasions in the control group in respect to residential area(Table 4). That meant women (rural and urban areas) in the control group were not practicable. In a study done by [9], it was indicated that rural people have poor information about disease, genetics, signs and symptom, prevention, how to manage their child before and during episode of bleeding and how to recognize the dangerous signs of bleeding. They also found that urban people have lack of information.

Relation of women's characteristics in pre- and post-test occasions: In the present study, it was found that significant difference between women's skills at pre- and post-test occasions in the study group and their ages (Table 5). That meant that women's skills were improved after implementation of the educational program in the study group, while in control group there was no significant difference between women's skills at pre- and post-test occasions and their ages (Table 5). This indicated that women in control group did not experience any changes in their skills when they were exposed to the pre- and post-test[10]. On the other hand, significant difference was noticed between women's skills at pre- and post-test occasions in the study group according to their educational level (Table 5), while in control group there was no significant difference between women's skills at pre- and post-test occasions according to their educational levels (Table 5). That meant that women from different educational levels gained better skills concerning their hemophilic children after implementation of the educational program in the study group.

This result was supported by work of[11] who found that educating women about bleeding information and skills "what to look for and what to do", information concerning first.

In this study, it was found that it's useful when a follow up is applied in two and four months after educational program implementation. This indicated that the amount of information acquired by these women were sufficient and effective after educational program so they had greater benefit than those in control group. So that the present study showed significant difference between the pre-test, post-test and follow up 1 and 2 of

the study group when hemophilia educational program was applied, while there was no significant difference found in pre-test, post-test and follow up 1 and 2 of the control group (Table 5). These finding were supported by[5] who reported that education about hemophilia is a primary requirement for affected families and their doctors. Morbidity and mortality are reduced by retraining from necessary intervention as well as by treating bleeds appropriately.

Conclusion: Most of the women in the study group got benefit from implementation of programme about their skills concerning hemophilic disease.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

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Isolation and Distribution of Microorganisms Causing Wound Infections in Diabetic Patients in Kirkuk City, Iraq

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Abstract

Background: Diabetic wound infections are considered one of the main life-threatening diseases among diabetic patients. Foot ulcers are accounting for up to twenty of diabetes-related hospital admission. If leaved untreated, they might result in amputation of feet and legs. The aim of current study was to investigate the isolation and identification of pathogenic microorganisms in wounds of diabetic patients in Kirkuk district, Iraq.

Method: Forty diagnosed diabetic patients, (18 males and 22 females)presented with wound infection at Azadi Teaching Hospital, were selected for the study. Swabs of pus and wound exudates were obtained from infected region for bacteriological studies. Then these swabs cultured on blood agar and MacConkey agar for facultative organisms and incubated at 37°C for 24 hours. All cultured isolates were investigated and identified by standard bacteriological and analytical profile index laboratory techniques.

Results: Data from current study revealed that single etiology was observed in 24(60%) of isolates. Polymicrobial infections were observed in 4(10%) of patients and 12(30 %) isolates were negative. Also, *Staphylococcus aureus* was the most common cause of infection which comprised 20% of isolates followed by Pseudomonas aeruginosa (15%) isolates. Moreover, it was found that 12 isolates were due to *Pseudomonas spp*. constituting 30% of isolates followed by *Staphylococcus spp*. accounting 25%.

Conclusion: There is no definite etiology in diabetic wound infections and *Pseudomonas spp*. were responsible for most of wound infections in diabetic patients.

Keywords: *Diabetic foot, wound infection, bacterial isolates, wound swab, Pseudomonas spp.*

Introduction

Diabetes mellitus (DM) is a clinical metabolic syndrome in which there's an increased blood sugar higher than the normal values due toto defects in insulin secretion and/or decline in the effectiveness of insulin(1). Prevalence of Type 2 DM (T2DM) has been increasing steady all over the globe and quickly turning into an outbreak in some countries of the globe, particularly in poorly developed countries. The number of individuals affected is expected to be twice the current number every decade alongside raised ageing population, thereby adding to the already existing load for healthcare suppliers. Untreated DM can cause serious long-term complications including peripheral vascular disease, stroke, chronic renal disease, foot ulcers and eye damages(2). Impaired life quality, entails high price and prolonged hospitalization are major health issues of diabetic foot (DF) disease (3). the latter is one of the foremost feared complications of diabetes. Foot ulcers are accounting for up to twenty of diabetes-related hospital admission. If leaved untreated might

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result in amputation of feet and legs due to secondary infection of those ulcers which might develop in the skin, muscle or bone of the foot as a results of the high glucose level, suppressed immunity, poor circulation and neuropathy[4,5]. It's currently appreciated that about 20% of the patients with such foot ulcers continue to need associate amputation. Nearly 85% of foot amputations are due to diabetic foot ulcers [6,7]. Usually such foot ulcers were infected by multiple organisms where anaerobic microorganism co-exist with aerobic organisms [8]. In such cases, anaerobic microorganism typically complicate chronic ulcers by producing daed materials and foul odor [9,10]. The purpose of the present study was to characterize microbial prevalence among wound infections of diabetic patients.

Patients and Method

Forty diagnosed diabetic patients (18 males and 22 females)presented with wound infection at Azadi Teaching Hospital from 10th, September 2018 to 15th, April 2019, were selected for the study. Their ages ranged from 44 to 73 years with mean±SD age of 56.47±9.77 years. Laboratory tests for evaluation of diabetes; fasting blood glucose (FBG; mmol/l) and hemoglobin A1c (HbA1c %) levels were collected from patients' laboratory data. A total of forty swabs were obtained from wounds of both inpatients and outpatients, screened for detection of pathogenic microorganisms by examination of swabs from wounds of diabetic patients. Complete information including age, gender, and type of diabetic, of both male and female individuals recruited in current study, also obtained.

Sample Collection: Samples were collected by means of rotation of sterile swabs (transport swab) from diabetic wounds. The swabs were transported to microbiology laboratory of the department in a transport media which prevent drying within 24 hours after collection. The swabs were inoculated onto blood agar, nutrient agar and MacConkey agar plates for isolating pathogenic bacteria. Then plates were incubated for 48hr at 37°C. After the incubation period, the plates were examined for growth and the isolated colonies were identified by morphological characteristics and bacterial morphology was observed from Gram-stained smears and biochemical investigations. The tests performed included Gram-staining, Catalase, Oxidase, API 20E and API Staph that included 20 tests of enzymatically and biochemical reactions such as (Urease, Voges Proskauer, citrate utilization production, mannitol and phenylalanine, Indole, cytochrome oxidase test... etc).

Statistical Analysis: Data obtained were analyzed using the Excel program version 10 package. The significance of invariant differences was assessed by student's *t*- tests and all values were two-sided. A *P*-value <0.05 was considered statistically significant.

Results

The present study included 40 diabetic patients, of whom 18 were males and 22 were females. The age ranged from 44 to ≥74 years. Different diabetic wound infections were highest among the age group of ≥74 years, followed by the 54–63 years age group. Statistically,results revealed that age and gender did not show significant relation with wound infections (P > 0.05; Table 1).

Table (1): Bacterial infection distribution according to patient's gender and age

Age Group/Years	No. Tested	Male No.(+ve%)	Female No.(+ve%)	Total (+ve%)
44 – 53	18	4(22.2)	10(55.6)	14(77.8)
54 – 63	10	2(20)	6(60)	8(80)
64 – 73	10	4(40)	2(20)	6(60)
≥74	2	0(00)	2(100)	2(100)
Total	40	10(25)	20(50)	30(75)

$X^2 = 4.507$. *P*=0.211; *P*>0.05 (Non-significant).

Bacteriological study of 40 patients with diabetic wound infections revealed that the total number of isolates was 32 representing five different bacterial genera. Isolated organisms were *Pseudomonas spp.* (30%), *Staphylococcus spp.* (25%), *Acinetobacterbaumannii* (10%), 5% for each of *Proteus marbles, Escherichia coli* and *Bacillus subtilis* and 4 isolates were mixed infections (Table 2).

Table (2): Types of bacteria isolated from patients with diabetic wounds

Bacterial Isolate	Number of Isolates	Percentage
Pseudomonas spp.	12	30
Staphylococcus spp.	10	25
Acinetobacterbaumannii	4	10
Proteus marbles	2	5
Escherichia coli	2	5
Bacillus subtilis	2	5
Total	32	80

The study revealed that polymicrobial infections were found in 4(10%) patients who were infected with two types of bacteria, while single etiology appeared in 24(60%) patients and 12(30%) cases showed no bacterial isolates (Table 3).

Table (3): Polymicrobial isolations from diabetic foot infections

Isolation Type	No. of Patients	%
Single bacterial isolate	24	60
Two bacterial isolates	4	10
No bacterial isolate	12	30
Total	40	100

Regarding distribution of bacterial isolates according to patients' gender, results of current study showed that bacterial isolates were distributed equally among males, while some variance among isolates distribution occurred among infected wound samples obtained from females (Figure 4) with a prominent frequency of *Staphylococcus epidermidis* among females which comprised 15% of positive cases followed by *Pseudomonas aeruginosa* with 10% of positive cases.

Table (4): Frequency and percentage distribution of bacterial isolates according to patient's gender

Isolate	Males No. (+ve %)	Females No. (+ve %)	Total No. (+ve %)
Pseudomonas aeruginosa	2(5%)	4(10%)	6(15%)
Proteus marbles	0	2(5%)	2(5%)
Staphylococcus aureus	2(5%)	6(15%)	8(20%)
Acinetobacterbaumannii	2(5%)	2(5%)	4(10%)
Pseudomonas stutzeri	2(5%)	2(5%)	4(10%)
Pseudomonas luteal	2(5%)	0	2(5%)
Staphylococcus epidermidis	0	2(5%)	2(5%)
Escherichia coli	2(5%)	0	2(5%)
Bacillus subtilis	0	2(5%)	2(5%)
Total	12(30%)	20(50%)	32(80%)

$X^2 = 6.458$. P=0.596; P>0.05 (Non-significant).

Discussion

According to official statistics issued by the Iraqi Ministry of Health in its annual report for 2013 that 2.9% of deaths in that year were due to diabetes disease and was expected to have, in that year specifically, more than 1.5 million cases of the disease. On the other hand, Iraq ranks 9th in the Arab world and 30th in the world with injuries up to 10.2% of the total. Iraq has a large population of Diabetic Foot Infection (DFI) and patients with a vast geographical distribution and significant variations in the types of bacterial infections found in DFI wounds from different regions[11,12]. Impaired life quality and prolonged hospitalization are the major health problem caused as a result of diabetic wounds infections[3]. Several factors including high blood sugar level, suppressed immunity, inadequate blood supply and neuropathy were contributed to enhance the infection of wounds of diabetic foot. The prevalence of DM in adults (T2DM) is predicted to have continuous increase in the next two decades especially in developing countries where the majority of patients are aged between 45 and 64 years [13]. The mean age of current study's participants was about 56.47 years and most of the diabetic patients with foot ulcer were within fifth decade of age. This finding was comparable with the results of retrospective

group study among Saudi population reported by[14] who demonstrated that 45 years age or older is a risk factor for developing diabetic foot ulcers. In agreement with most studies[15,16] DFI patients were often elderly males with multiple complications, possibly due to the improper blood sugar control, burdens of life and exercise habits. Regarding the relation of patient's gender with DF disease, data are controversial [17]. Although previous studies found that male gender was predominant in DF patients[18,19], current study showed that two-thirds of the cases were female patients. In another study[20], which included 248 type II patients with diabetic foot, the authors found that sex may imply a significant risk factor for the development of diabetic ulcers. The authors cannot exclude the impact of gender rules on women's health in the local area. Comparable to the paragraph mentioned by[21], women may find that health services are inaccessible or conditioned on certain cultural grounds or gender rules, such as restrictions imposed by the male guardianship system; religious norms may affect access, quality and outcomes for women. These factors can also be responsible for higher frequency of DF-related manifestations observed among women than men. Among common Gram-positive organisms, Staphylococcus aureus was the most common. However, the percentage of Staphylococcus aureus decreased with prolonged duration of the ulcer, while Enterococci proportion gradually increased. A previous study [22] indicated that enterococci often appeared in patients with immune deficiency and could participate in the formation of biofilms[18]. In the present study, the most frequent bacterial isolates were Pseudomonas aeruginosa (30%) and Staphylococcus aureus (25%). These findings were comparable to the findings of [16] who reported that Staphylococcus aureus and Pseudomonas aeruginosa were the most common causes of diabetic foot infections in India. Further analysis showed that the most common gram negative organism types among patients with long-standing foot wounds were Pseudomonas aeruginosa which accounted for 16.6%.[15]. Findings of many studies showed that HbA1c was a contributory factor for DF ulcer [23-25]. This may be due to raised blood sugar, which has been considered a risk factor for the development of diabetic foot ulcers because of its contribution toward the development of peripheral neuropathy and microvascular complications[26]. Our study reported that older age and poor glycemic control are important risk factors related to diabetic foot development in the current T2DM population. Most of these factors can be corrected or at least controlled with a large opportunity for early prevention and treatment with the subsequent decrease in patients with diabetic foot and its ending sequel of amputation.

Conclusion

There is no definite etiology in diabetic wound infections and *Pseudomonas spp*. were responsible for most of wound infections in diabetic patients.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

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C-Reactive Protein and Soluble Intercellular Adhesion Molecule-1 in Helicobacter Pylori Infection Associated with Chronic Renal Failure

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Abstract

Background: Patients with chronic renal failure have higher risk of *Helicobacter pylori* infectionas a result of chronic systemic and local circulatory failure, hypergastrinemia, high ammonia and the developed inflammation. Infection with *Helicobacter pylori* may lead to changes in some inflammatory markers. This study was aimed to investigate the influence of *Helicobacter pylori* infection onserum levels of C-reactive protein, soluble intercellular adhesion molecule-1 and lipid profile in Iraqi patients with chronic renal failure.

Method: The study included 56 individuals who attended Kirkuk General Hospital to receive hemodialysis. They were divided into 2 groups; chronic renal failure patients with *Helicobacter pylori* seropositive (Group 1) and seronegative (Group 2) infections. Group 3 included 30 apparently healthy subjects as control group who were age- and gender-matched to patients groups. Lipid profiles were measured by enzymatic analytical chemistry. C-reactive protein, soluble intercellular adhesion molecule-1 and anti *Helicobacterpylori* IgG were assayed by ELISA technique.

Results: When we compared chronic renal failure patients with *Helicobacter pylori* seropositive and seronegative infections to healthy normal renal function subjects,we found significant increase in C-reactive protein and soluble intracellular adhesion molecule-1 levels, whilst there were no significant differences between *Helicobacter pylori* seropositive and seronegative chronic renal failure patients (P>0.05). In this regard, lipid profile results showed a significant reduction in total cholesterol and High density lipoprotein levels inpatients. Also, linear correlation was found between soluble intracellular adhesion molecule-1 level and creatinine.

Conclusion: The result of this study concluded that impaired renal function is associated with endothelial dysfunction and raised inflammatory activity as assessed by serum levels of soluble intracellular adhesion molecule-1 and C-reactive protein as well as urea and creatinine levels, yet these patients had reduction in lipid profile as a result of malnutrition. However, *Helicobacter pylori* infection didn't induce significant changes in the levels ofstudied parameters which are considered important risk factors for atherosclerosis.

Keyword: *Chronic renal failure, Helicobacter pylori infection, C-reactive protein, Soluble Inter cellular Adhesion Molecule-1, lipid profile.*

Introduction

Chronic renal failure (CRF) patients receiving hemodialysis (HD) treatment for long period are often encounter to heart failure, hypertension, renal anemia, parathyroid-related disease and suffer from gastrointestinal troubles including peptic ulcer, abdominal symptoms, diarrhea, hemorrhage and constipation[1,2]. *Helicobacterpylori* (*H. pylori*) are Gram-negative bacteria transmitted from human to human and colonize the stomach. Its infection is associated with the development of gastrointestinal disease such as peptic ulcer disease (PUD), mucosa-associated lymphoid tissue (MALT) lymphoma and gastric cancer both in patients

with CRF receiving hemodialysis and in individuals with normal renal function[3-5]. Its infection is prevalent in about 50% of the population in developed countries and colonizes 70-90% in developing countries[6]. As a result of the increase in both of prevalence of *H.pylori* and their resistance to antibiotics, this bacterial species is recognized as a high-priority pathogen by World Health Organization in 2017[7]. Raised levels of C-reactive protein (CRP), intercellular adhesion-1 (ICAM-1) and dislipidemia were reported by previous studies in chronic renal failure patients with *H.pylori* infection[8-10]. These parameters considered as risk factors for cardiovascular events.-CRP is a nota specific marker, increased level of this protein might indicate acute inflammation and increased risk of suffering from a heart attack[11,12]. Previous results reported significant association of *H. pylori* infection with elevated serum CRP[13,14]. In addition, expression of ICAM-1 was higher in atherosclerotic plaques containing *H. pylori* infection than in those without it [15] as well as hemodialysis treatment enhances elevation of ICAM-1 level in chronic renal failure patients[16]. Accordingly, the present study was aimed to investigate the influence of *H.pylori* infection on serum levels of CRP, soluble ICAM-1 and lipid profile in chronic renal failure patients.

Materials and Method

This study was performed on 86 subjects divided into three groups. Group 1 included 26CRF patients with *H.pylori* seropositive infection, their age range was 30-79 years. Group 2 included 30 CRF with *H.pylori* seronegative, their age range was 46-70 years. Group 3 served as control group; included 30 apparently healthy individual who were age- and gender-matched to patient groups. Allpatients were recruited for dialysis unit at Kirkuk General Hospital during the period from October 2018 to March 2019. Five milliliters of venous blood sample was collected from each participant, centrifuged for 10 minutes at 1000rpm, then frozen and stored at -20º Cuntil the time of assessment. To determine serum levels of urea, creatinine, total cholesterol (TC) and high-density lipoprotein (HDL-C), we used kit from the British company Randox according to instructions provided by the company. On the other hand, serum level of triglyceride was measured using the CTM (UK) kit, according to instructions of the supplied company. The level of CRP and sICAM-1 were measured with sandwich enzyme immunoassay technique (ELISA) kits, (LABOR DIAGNOSTIKA NORD (LDN)/Germany for CRP and Mybiosource/USA for sICAM-1).To detectanti *H.pylori* IgG, we used Trinity Biotech/Ireland ELISA kit.

Statistical Analyses: All data were given as mean±SD and analyzed using Statistical Package for Social Sciences (SPSS, version 13). The differences between means,with regard to biochemical tests, were assessed by Duncan's test, while differences between means of CRP and sICAM-1 were assessed by student's *t*-test. Pearson rank correlation was used to detect the correlation between parameters. The probability value less than 0.05 considered statistically significant.

Results

Out of the 125 patients with CRF recruited in current study, 26(21%) were seropositive and 99(79%) were seronegative to *H.pylori* infection. Out of 26 seropositive patients, 17 were males whose age ranged between 30 and 79 years and 9 were females whose age ranged between 46 and 70 years. The study showed statistically significant increase in serum levels of urea and creatinine in both group 1 and group 2 patients compared to control group. On the other hand, there was significant decrease in serum levels of TC and HDL-Cin patients rather than control group. Also, LDL level significantly decreased in *H.pylori* seropositive infection rather than control group. Serum levels of TG and VLDL were approximate among studied groups (Table 1).

Table 1: Comparison between studied groups with regard to biochemical parameters

Parameter	Group 1 (n=26)	Group 2 (n=30)	Group 3 (n=30)
Urea (mg/dl)	124.5^{A}±6.11	118.83^{A}±4.33	26.5^{B}±1.32
Creatinine(mg/dl)	3.89^{A}±0.05	5.518^{A}±0.04	0.62^{B}±0.02
Cholesterol(mg/dl)	136.87^{B}±6.11	142.72^{B}±7.65	182^{A}±3.51
Triglycerides(mg/dl)	134.12^{A}±40.7	106.75^{A}±8.22	123.85^{A}±7.2
HDL-C (mg/dl)	33.37^{B}±2.04	31^{B}±0.71	41.45^{A}±1.22
LDL(mg/dl)	80.8^{B}±4.53	91.07^{AB}±5.54	118.2^{A}±3.33
VLDL(mg/dl)	23.97^{A}±1.57	21.97^{A}±1.4	24.91^{A}±0.05

Data were presented as mean ± SD. Different letters represented a significant difference (P≤ 0.05) between means of rows, while similar letters referred to non-significant difference (P≥0.05) between these means.

Using ELISA technique, serum level of CRP was significantly increased in groups 1 and 2 compared to control group. Also, this study revealed that serum levels of CRP were markedly increased in *H.pylori* seropositive patients than *H.pylori* seronegative patients. However, they were not statistically significance (Table 2 and Figure 1).

Table 2: Comparison of serum CRP levels between study groups

Study group (Serum CRP level in ng/ml)	***P* value**		
Group 1 (9892.5±722.21		*P*>0.05**	*P*<0.0001***
Group 2 (7646.25±642)	*P*>0.05*		*P*<0.001***
Group 3 (500±70.19)	*P*<0.0001*	*P*<0.001**	

*Comparison between group 1 and other groups. **Comparison between Group 2 and other groups. *** Comparison between Group 3 and other groups.

Regardind serum levels of sICAM-1, there was a reduction in soluble form of ICAM-1 level in *H.pylori* seropositive patients more than in *H.pylori* seronegative patients, but didn't reach statistical significance (P>0.05; Table 3 and Figure 2).

Table 3: Comparison of serum levels of sICAM-1 (ng/ml) among studied group

Study group (Serum sICAM-1 level in ng/ml)	***P* value**		
Group1(126.5±22.1)		P>0.05**	P< 0.01***
Group2(169.40±11.3)	P>0.05*		P< 0.0001***
Group3(47.2±1.4)	P< 0.01*	P< 0.0001**	

*Comparison between group 1 and other groups. **Comparison between Group 2 and other groups. *** Comparison between Group 3 and other groups.

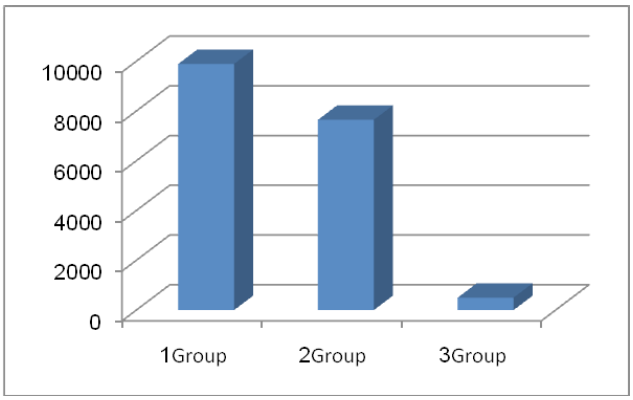

Figure 1: Mean serum CRP levels (ng/ml) in study groups.

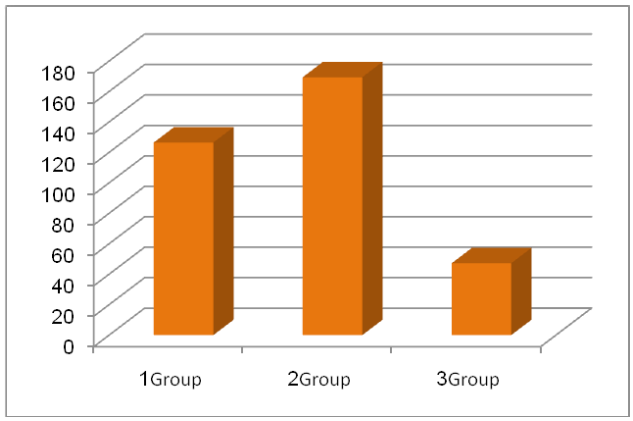

Figure 2: Mean serum levels (ng/ml) of sICAM-1 among studied groups.

When we studied the correlation between serum levels of CRP, sICAM-1 and urea, creatinine, TC, HDL-C, LDL-C and VLDL-Cin*H.pylori* seropositive patients by using Pearson rank correlation, data showed significant direct correlation between sICAM-1 level and creatinine level (r= 0.859, *P*=0.013; Table 4).

Table 4: Correlation and predictive value for the parameters in CRF patients with H.pylori seropositive infection

Parameter	CRP		sICAM-1	
	r	*P*- Value	r	P-Value
Urea (mg/dl)	0.138	0.769	-0.172	0.713
Creatinine (mg/dl)	-0.112	0.811	0.859	0.013
Cholesterol (mg/dl)	-0.274	0.551	-0.120	0.797
Triglycerides (mg/dl)	0.220	0.635	0.422	0.346
HDL-C (mg/dl)	-0.234	0.613	-0.449	0.313
LDL (mg/dl)	-0.293	0.524	-0.220	0.636
VLDL (mg/dl)	-0.176	0.705	0.236	0.610
sICAM-1 (ng/ml)	-0.271	0.557	-	-

r: Correlation coefficient

Discussion Chronic inflammation triggers release of proinflammatory cytokine such as IL-1,IL-6 and TNF-α,which contribute to atherosclerosis events and endothelial dysfunction[17,18]. Chronic inflammationis a common feature of end-stage renal disease[19] as well as chronic *H. pylori* infectionmay lead to chronic gastritis, gastric cancer and peptic ulcer. Also, alteration in lipid profile is another consequence to systemic inflammatory status[20].

Our result denoted that serum levels of total cholesterol (TC), low density lipoprotein (LDL) and high density lipoprotein(HDL) were decreased significantly in systemic circulation of groups 1 and 2 patients compared to control group, while there were no change in serum levels of triglycerides (TG) and very low density lipoprotein(VLDL). A previous study[20] reported that *H.pylori* infection is associated with high TC, LDL and TG, yet lower HDL-C serum levels. Another study[21] reported an increase in TG serum level in *H.pylori* patients. Decreases in serum levels of lipid variables in chronic renal failure patients may be due to malnutrition as a result of multiple pathophysiologic alterations including decreased appetite and nutrient intake, metabolic imbalances, hormonal derangements, increased catabolism, inflammationand dialysis-related abnormalities[22,23].

Our results showed a statistically significant increase in CRP level, which indicated an acute inflammatory status. The production of this proteinis regulated by proinflammatory cytokine, such as IL-6, this cytokine is modified by other cytokines, growth factors and hormones such as insulin and cortisol[24]. Another study[25]associated the raised concentration of CRP with other conditions such as increased age, smoking, *H. pylori* and symptoms of chronic bronchitis as well as *Chlamydia pneumonia* infection and BMI.

In our study we found that chronic renal patients with *H.pylori* seropositive and seronegative infections had significantly higher levels of sICAM-1 than healthy controls. This finding was similar to[11] who reported that the expression of adhesion molecule (sICAM-1) was elevated in plaques containing *H.pylori* than in those without it and mentioned that *H.pylori* was detected in atherosclerotic plaque in addition to gastric mucosa [15,25]. In addition, hemconcentration of sICAM-1 in chronic renal failure may be due to shedding of this molecule from surface of lymphocytes and monocytes and releasing it into circulation stimulated by hemodialysis membrane[26] as well as decreased elimination by the impaired kidney which plays an important role in their catabolism[27]. Elevated serum levels of soluble ICAM-1 were directly correlated with the level of creatinine reflecting glomerular filtration rate (GFR). Renal dysfunction diminishes the ability to filter creatinine and serum creatinine rises. The glomerular filtration rate is clinically important because it is a measure of kidney function.

Conclusion

The results of this study concluded that impaired renal function is associated with endothelial dysfunction and raised inflammatory activity as assessed by serum levels of sICAM-1 and CRP. Also, these patients had reduction in lipid profile as a result of malnutrition.

Moreover, there was significant positive association between the levels of ICAM-1 and creatinine. In contrast *H.pylori* infection showed no significant differences in the levels of studied parameters when compared with its seronegative cases. These are considered risk factors for cardiovascular disease.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

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Gonial Angle as a Determinant of Gender, a Panoramic Study in a Sample of Saudi Population

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Abstract

Introduction: Sex determination is a valuable factor in forensic dentistry. The present study aims to assess the possibility of using gonial angle as a determinant of gender through a retrospective panoramic study, in a sample of Saudi population.

Materials and Method: A 342 digital panoramic radiographs (179 males and 163 females) of adult dentulous Saudi patient attending university dental hospital, Qassim university, KSA were assessed in this studywere assessed in this study. Gonial angle measurements were calculated bilaterally.

Results: The mean values were calculated and compared between male and female subjects using SPSS (V. 22). Level of significance was set at 0.005. The mean values of the external gonial angle measured using the panoramic radiographs were 125.50±5.95° and 127.45±6.77°, respectively.

Conclusion: In the present study, statistically significant difference was observed between the gonial angles measured in between males and females using panoramic radiographs. Gonial angle can be considered reliable for gender determination.

Keywords: *Gonial angle, Gender, Retrospective, Sex determination, Panoramic.*

Introduction

In dental practices diagnosis and treatment planning can be formulated by utilizing the gathered data from the case history and diagnostic aids such as clinical examinations, study models, and the relevant radiographs. Dentofacial radiography has become a critical procedure in the dental, medical, and hospital clinics. Similarly,lateral cephalogram and panoramic radiograph are essential for diagnosis and treatment planning in orthodontics.[1]

The gonial angle in cephalometric x-rays is an important parameter for determining the growth pattern of an individual, assessing the rotation of the mandible[1] and the extraction pattern in class II patients,[2] making decisions regarding whether to perform surgery in class III skeletal base patients,[3] and estimating age in forensic medicine.[4,5]

Panoramic radiography, which is considered the gold standard of care for dental screening, diagnosis and treatment planning, is used by dentists from other specialties and orthodontists alike. It provides a significant amount of information about the dentation and the supporting bone, and also is used for screening of pathological and developmental problems such as cysts, tumors, cancer,supernumerary teeth, the congenital absence or premature loss of teeth, fused teeth to the bone, abnormally retained teeth, tooth eruption path especially of third molars, bone pathology, and mandibular asymmetry.[6,7] Panoramic radiography are useful for measuring the gonial angle with accurate performance than lateral cephalography, as the superimposed gonial angles in cephalography can affect their tracing.[8,9]

A panoramic radiograph provides adequate information about both left and right sides; hence, it would be reasonable to assess them equally.[10,11] Determination of gender is an important part of forensic science and anthropology and in medico-legal issues.

Among various other measures, gonial angle can be used to differentiate between male and female strongly to express univariate sexual dimorphism. When skeletal sex determination is considered, angular and metric analyses on the radiographs are often found to be of greater importance because of their, reliability, reproducibility, accuracy and objectivity.[12,13]

Determination of sex becomes more appropriate after attainment of puberty as the differences are well marked well in skull and bony pelvis.[14] After both these bony areas, mandible remains the next best in the human beings which will help us in the identification of age, sex, and race.[14] Therefore, mandibular condyle and ramus, in particular, are generally the most sexually dimorphic.[12,13] There by among various radiographic technique the orthopantomography (OPG) is still best used as a measure in determination of sex wherein, the morphology of mandibular ramus is researched. Changes in gonial angle (mandibular angle) are of important value in age and sex determination. Very few studies have been carried out to study the changes in the mandibular angle with age, sex and dental status. One of the choices for gonial angle measurement is panoramic radiograph. Hence, this study was taken to understand gonial angle as adeterminant of gender in a panoramic study in a sample of Saudi population.

Materials and Method

Ethics approval (#DRC/002FA/19) for the study was obtained from the Dental Ethics Committee, Alrass Dental College, Qassim university, KSA. Digital panoramic radiographs (OPG) of 324 patients (163 females and 179 males; mean age of 29.05±7.93 years) were obtained from the department of radiology, university dental hospital, Qassim university, KSA. The inclusion criteria for the OPG were:patient in permanent dentation stage, the OPG had to be of high image quality and sharpness and all OPGs had to be taken using the same machine. The exclusion criteria were a recorded history of facial trauma, previous facial/mandibular surgery, and congenital syndromes affecting the face or jaw, and asymmetry of face. The gonial angle was drawn with a tangent to the lower border of the mandible and another line tangent to the distal border of the ascending ramus and the condyle on both the sides then the gonial angle was measured at the point of intersection of the plane tangential to the lower border of mandible and to the distal border of the ascending ramus and condyle (Figure 1).

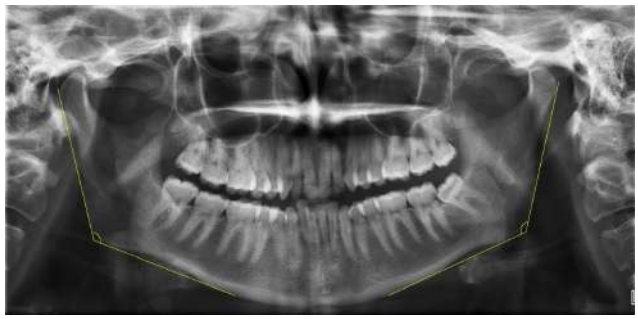

Figure 1: Gonial angle measurementon the digital panoramic radiograph

The gonial angle was measured using Digora software. Paired t-test was used for evaluating the difference between the gonial angle in the panoramic OPG, and Student t-test was used for assessing the difference in the gonial angle with respect to sex. The analyses were performed using SPSS version 22.0; a P-value of < .05 was considered to indicate statistical significance.

Results

Statistical Method used was descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean ± SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5 % level of significance. The following assumptions on data are made, Assumptions: 1. Dependent variables should be normally distributed, 2. Samples drawn from the population should be random, and cases of the samples should be independent. Student t test (two tailed, independent) has been used to find the significance of study parameters on continuous scale between two groups (Inter group analysis) on metric parameters. Leven`s test for homogeneity of variance has been performed to assess the homogeneity of variance. Chi-square/Fisher Exact test has been used to find the significance of study parameters on categorical scale between two groups, Non-parametric setting for Qualitative data analysis. Fisher exact test used when cell samples are very small.

The study sample consisted of retrospective panoramic radiographs of 324 patients (163 females and 179 males; mean age of 29.05±7.93 years as seen in Figure 2). The mean value of the gonial angle measured using the panoramic radiographs was 126.43±6.42 with a standard deviation of 0.90°, The mean value of the right gonial angle measured using the OPG in females was

127.68±6.69°, and 125.64±5.91 in males; the P-value was .003. Further, the mean value of the left gonial angle was 127.23±6.86° in females, and in 125.35±6.02° inmales; the P-value was .007. The mean gonial angle was 126.43±6.42° and the P-value was .005, which was also statistically significant (Table 1 and Figure 3).

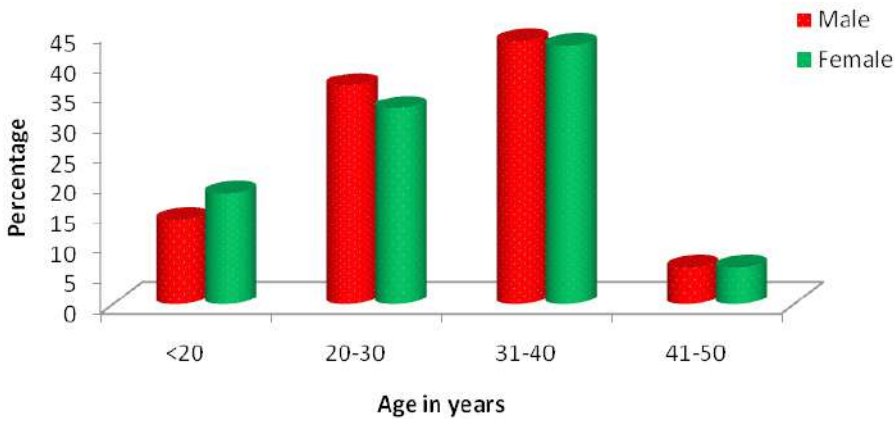

Figure 2: Age distribution of patients studied

Table 1: Comparison of Gonial Angle according to Gender

Variables	Gender		Total	P value
	Male	Female		
Right Gonial Angle	125.64±5.91	127.68±6.69	126.61±6.37	0.003**
Left Gonial Angle	125.35±6.02	127.23±6.86	126.24±6.49	0.007**
Mean Gonial angle	125.50±5.95	127.45±6.77	126.43±6.42	0.005**

Discussion

The gonial angle reflects the morphology of the mandible and has a very important role in growth pattern prediction and estimating age in forensic medicine and forensic dentistry.[15] It is also an important parameter for evaluating the symmetry of the facial skeleton.[1,2] According to Mattila et al.[10] and Dahan et al,[11] the size of the gonial angle depends on the method of measurement used. These measurements can beformed through a line tangent to the lower border of the mandible or be based on a line passing through the gnathion. On a panoramic radiograph, the determination of the gnathion can sometimes be difficult and might result in an inaccurate measurement of the gonial angle.[15] Therefore, in this study, to avoid any inaccuracies in measurement, the horizontal plane of the gonial angle in both the panoramic radiograph and the lateral cephalogram was formed by a line drawn tangentially to the lower border of the mandible.

The mean values of male and female external gonial angle measured using the panoramic radiographs were 125.50±5.95° and 127.45±6.77°, respectively. Further, statistically significant difference was observed in the gonial angle measured using this diagnostic tool. Mattila et al.[10] measured the gonial angle using panoramic radiographs and lateral cephalograms, compared the values with those found using dry skulls, and concluded that the measurements made using the panoramic radiographs were more accurate. Shahabi et al.[16] compared the external gonial angle determined using panoramic radiographs of patients and concluded that panoramic radiography could be used for determining the gonial angle as accurately as a lateral cephalogram. Arakiet al,[17] in 2015, compared the gonial angles measured using 49 panoramic radiographs with the gonial angle estimated using lateral cephalometric radiographs taken from 2 dry mandibles and found that the gonial angle measurements were slightly smaller on the panoramic radiographs than on the lateral cephalometric radiographs. Alhaija et al.[18] evaluated the potential of panoramic radiographs to measure mandibular inclination and steepness; they observed a high correlation between the measurements taken using both types of radiographs. Thus, according

to their study, panoramic radiographs are a useful tool for the measurement of the gonial angle, which is an indicator of mandibular steepness and, subsequently, the mandibular growth direction. In a previous study, the reliability of cephalometric measurements made using panoramic radiographs was compared with that of the actual measurements collected from dry skulls.[17] The results recorded the highest correlation between orthopantomography and cephalometric radiograph with respect to the measurement of the gonial angle, whereas the least correlation was observed for the length of the mandibular body. Further, in the case of different growth patterns, the gonial angle and the ramus height showed the closest correlation between the 2 types of radiographs.[10] Thus, the ability to determine the growth direction from a panoramic radiograph is useful because most dentists request a panoramic radiograph for patients during routine dental examinations.

In lateral cephalometric radiograph, gonial angle measured between atangent line with the inferior border of the mandible and along the posterior border of the mandibular ramus of superimposed mandibular halves. According to Nohadani and Ruf,[19] angular values from panoramic radiographs are more reliable, as the angular values in the posterior and the lateral aspects of the mandible for determining the gonial angle.

Sex estimation is very important from a forensic point of view. Mandibular condyle and ramus in particular are most sexually dimorphic as they are the sites associated with the greatest morphological changes in size and remodeling during growth.[20] Therefore, in the present study, mandibular ramus was selected for sex estimation as it is a part of gonial angle.

As regards the gonial angle, males showed statistically significant lower mean gonial angle values than females (125.50 º and 127.45 º respectively). This was in agreement with many researchers.[21,22.23] Conversely, other researchers found that males showed statistically significant higher mean gonial angle values than females,[24] whereas others did not find any statistically significant differences between both sexes.[16,25] It was found that females had a downward and backward rotation pattern in mandible while males had a forward rotation in mandible therefore the gonial angle values found in females are higher than in males.[26]

To sum up, our results support previous research on other populations that the gonial angle showed a sexual dimorphism and proved to be beneficial in sex estimation and Hence, the use of gonialangle is recommended as an aid for sex estimation in forensic analysis. However, further studies using larger sample size from diverse Saudi Arabian regions and different imaging modalities are recommended to set our population standards for sex estimation.

Conclusion

In the present study, statistically significant difference was observed between the gonial angles measured in between males and females using panoramic radiographs. Panoramic radiography can be considered reliable for measuring the gonial angle. In the selected Saudi Arabia population sample, the gonial angle showed a high sexual dimorphism and proved to be beneficial in sex estimation.

Conflicts of Interest: The author declare that there is no conflict of interest regarding the publication of this paper.

Source of Funding: Self

Ethical Clearance: Ethical clearance has been taken from Institutional Ethical Committee

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Determinants of Under-Five Mortality in Southern Asia

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Abstract

Under-five mortality is one of the important indicators for measuring the overall child health status of a country or region. One of the sub-goals of the Sustainable Development Goals (SDGs-2015) is reduction of under-five mortality rate to at least as low as 25 deaths per 1,000 live births by 2030. The present study aims at investigating the determinants of under-five mortality in Southern Asia. The results of the GLS Random Effects regression found adolescent fertility rate, measles immunization, basic drinking water services, prevalence of anemia among children and current health expenditure to be significant determinants of under-five mortality.

Keywords: *Southern Asia, Sustainable Development Goals, Under-Five Mortality.*

Introduction

The under-five mortality rate is the probability of dying between birth and exactly five years of age expressed per 1,000 live births (UNICEF). The Sustainable Development Goals (SDGs-2015) under its Goal-3 (ensure healthy lives and promote wellbeing for all at all ages) proposed the sub-goal of reducing under-five mortality rate to at least as low as 25 deaths per 1,000 live births by 2030. Globally, the total number of under-five deaths has dropped from 9.8 million in 2000 to 5.4 million in 2017.[1(p27)] According to the Sustainable Development Goals Report 2019[1(p27)], "if the SDG target for under-5 mortality is met, the lives of an additional 10 million children will be saved by 2030". This makes under-five mortality an important area of concern as well as an essential indicator for measuring a country's or region's child health status. Although there has been tremendous progress in reducing under-five mortality over the past decades, yet the progress differs across countries and regions.[2(p12)] The present study aims at investigating the determinants of under-five mortality in Southern Asia countries. Currently, Southern Asia experience around 28.1 per cent share of global under-five deaths.[2(p13)] It is further projected that if the same trend continues, about 52 million children under-five years of age will die between 2019 and 2030, and around 26 per cent of these deaths will occur in Southern Asia.[2(p15)] Thus a study on the determinants of under-five mortality will be helpful in understanding the important areas that needs attention in the Southern Asian countries in reducing under-five mortality.

Review of Literature: Koenig et al. (1990) found that in rural Bangladesh measles vaccinated children experienced a reduction in mortality risk by 46 per cent.[3 (p444)] Emamgholipour and Asemane (2016)[4] used panel data from 1996 to 2012 to study the effect of governance indicators on under-five mortality rate in 27 Organization for Economic Co-operation and Development (OECD) countries using the Generalized Method of Moments (GMM) model. Their study found a significant positive effect of previous period's under-five mortality rate and total fertility rate on current under-five mortality rate and a significant negative effect of GDP per capita, public health expenditure per capita, control of corruption and rule of law on current under-five mortality rate.[4] Sohail and Neupane[5] (2018) used Demographic and Health Survey (between 1999 and 2014) data to study the prevalence and the factors associated with under-five mortality in five South Asian countries (Bangladesh, India, Maldives, Nepal and Pakistan). They studied the relationship between

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outcome variable (under-five mortality) and the socio-demographic, maternal and child variables and found the age of the mother, mother's employment status, level of education of mother and her husband to significantly influence under-five mortality among children.[5] Waziri et al.[6] (2018) conducted a study on the effect of access to safe drinking water and good sanitation on under-five mortality rate in 81 developing countries using the Generalized Method of Moments (GMM) method for panel data from 2008 to 2016. According to their analysis access to safe drinking water (–0.138) and good sanitation (–.065) were found to be negatively associated with under-five mortality.[6] Ghimire et al.[7] (2019) analyzed the factors associated with under-five mortality in Nepal using Cox proportional hazard models on Nepal Demographic and Health Survey (2001, 2006, 2011 and 2016) data. Their study found under-five mortality to be significantly associated with mothers with a history of previous child death, mothers who did not receive TT vaccine during pregnancy and mother's who were not using contraceptives at the time of the survey.[7] Rahman et al.[8] (2019) found that in Bangladesh the under-five mortality was higher among children whose father's had no education and primary level education (compared to those whose father's had higher education), who did not take vitamin A dose in the first two months and those with multiple birth (compared to the single birth child).

Methodology

The study uses balanced panel data from 2002 to 2016 for the eight Southern Asia countries, namely, Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, India, Pakistan and Sri Lanka. The data are gathered from the World Bank open data. In order to choose between the Fixed Effect Model and the Random Effect Model, the Hausman test is applied. A series of diagnostics test is also used for checking Autocorrelation [Wooldridge test] and Heteroskedasticity [Breusch-Pagan/Cook-Weisberg test] before proceeding for final analysis. Table 1 shows the measurement of the variables used in the study.

Table 1: Measurement of the Variables

Type of Variable	Name of the variable (Abbreviation used in the study)	Measurement
Dependent Variable	Under Five Mortality Rate (UFMR)	Mortality rate, under-5 (per 1,000 live births)
Independent variables	Adolescent Fertility Rate (AFR)	Adolescent fertility rate (births per 1,000 women ages 15-19)
	Current Health Expenditure (CHE)	Current health expenditure (% of GDP)
	Measles Immunization (MI)	Immunization, measles (% of children ages 12-23 months)
	Basic Drinking Water Services (DWS)	People using at least basic drinking water services (% of the population)
	Prevalence of Anemia among Children (PAC)	Prevalence of Anemia among children (% of children under 5)

Findings and Discussion

Table 2 shows the descriptive summary (mean, standard deviation, minimum and maximum value) of the variables used in the study for the period 2002-2016. The total number of observations is 120.

Table 2: Descriptive Summary of the Variables

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
UFMR	120	53.35	29.87072	8.2	121.2
AFR	120	56.88448	36.43798	8.4072	146.433
CHE	120	4.934217	2.59498	2.151902	11.47104
MI	120	81.59167	16.37301	35	99
DWS	120	84.42485	15.78563	29.90076	99.23921
PAC	120	48.60333	11.19451	25.2	69.5

Source: Authors calculation

In the next stage of the study, the Hausman test is used to select the appropriate model (between the Fixed Effect Model and the Random Effect Model) for the analysis. The Hausman Test is based on the null hypothesis (H_0) that 'Random-effect model is appropriate' against the alternative hypothesis (H_1) that 'Fixed-effect model is appropriate'. If the p-value is less than 5% ($p<0.05$), the null hypothesis is rejected or in other words, the alternative hypothesis is accepted and vice versa. Table 3 shows the result of the Hausman Test. Since the p-value (0.1097) is greater than 0.05 (or 5%), the null hypothesis cannot be rejected and we can infer that the Random Effect Model is appropriate for our analysis.

Table 3: Hausman Test

Chi^2 (5)	p-value
8.98	0.1097

Source: Authors calculation

Further Table 4(a) and 4(b) shows the results of the diagnostics tests used for checking Autocorrelation and Heteroskedasticity in the regression model respectively.

Table 4(a): Wooldridge Test for Autocorrelation in Panel Data

H_0: no first-order autocorrelation	
F	1.305
Prob > F	0.2909

Table 4(b): Breusch-Pagan/Cook-Weisberg Test for Heteroskedasticity

H_0: Constant variance	
$Chi^2(1)$	23.16
Prob > Chi^2	0.0000

Source: Authors calculation

As shown by Table 4(a), the results of Wooldridge Test for Autocorrelation shows that the probability value (0.2909) of the F-statistics is greater than 5% (0.05) and as such we accept the null hypothesis (H_0= no first-order autocorrelation) and can infer that the model does not suffer from the problem of autocorrelation. As shown by Table 4(b), the probability value (0.000) of the Breusch-Pagan/Cook-Weisberg Test for Heteroskedasticity is less than 5% (0.05) and as such we reject the null hypothesis (H_0= constant variance) and can infer that the model suffers from the problem of heteroskedasticity. Thus we use the Generalized Least Squares (GLS) Random Effects (robust) regression model which helps in eliminating the effects of heteroskedasticity in panel data.

Table 5: Random-effects GLS regression

Variable	Coefficient	Robust Std. Err	p-value
AFR	.2871944	.0797656	0.000
CHE	-1.162038	.653848	0.076
MI	-.6520925	.136066	0.000
DWS	-.4783821	.1437625	0.001
PAC	.6750055	.2249481	0.003
Constant	103.532	28.2566	0.000
Overall R-square = 0.8863, Prob > Chi^2 =0.0000			

Source: Authors calculation

Table 5 shows the result of the regression. The overall R-square value is significantly large indicating the model explains around 88 per cent goodness of fit. Based on the p-value we can infer the Adolescent Fertility Rate (AFR), Measles Immunization (MI), Basic Drinking Water Services (DWS) and Prevalence of Anemia among Children (PAC) are significant at 1 per cent while Current Health Expenditure (CHE) is significant at 10 percent. Adolescent Fertility Rate (AFR) has positive association with Under Five Mortality Rate (UFMR). That is with increase in adolescent fertility under five mortality increases. Adolescent mothers are often exposed to the risk of unwanted pregnancy, premature births, and low birth weight of children etc. which may increase the risk of child mortality. Current Health Expenditure (CHE) has negative association with Under Five Mortality Rate (UFMR), that is with increase in current health expenditure (% of GDP) under five mortality decreases. Measles Immunization (MI) also has negative association with Under Five Mortality Rate (UFMR), that is increase in measles immunization(% of children ages 12-23 months) decreases under five mortality. Basic Drinking Water Services (DWS) has negative association with Under Five Mortality Rate (UFMR), that is increase in people (percentage of the population) using at least basic drinking water services decreases under five mortality. Prevalence of Anemia among Children (PAC) has positive association with Under Five Mortality Rate (UFMR), that is increase in prevalence of anemia among children (% of children under 5) increases under five mortality.

Conclusion

The under-five mortality rate is the probability of dying between birth and exactly five years of age

expressed per 1,000 live births (UNICEF).Globally, although the total number of under-five deaths has dropped in recent time, yet the progress differs across countries and regions. Currently, the Southern Asian countries experience around 28.1 per cent share of global under-five deaths.[2(p13)] This makes under-five mortality an important area of concern in the region and the present study aims at investigating the determinants of under-five mortality in Southern Asia. The results found adolescent fertility rate and prevalence of anemia among children to be positively associated with under five mortality and measles immunization, basic drinking water services, and current health expenditure to be negatively associated with under five mortality. Policies should strive to direct funds and resources towards increasing the availability of educational and health facilities, especially for the adolescents; increase access to improved drinking water and sanitation through various programmes as well as promote research and development to explore better ways of tackling the incidence of under-five mortality .

Conflict of Interest: Nil

Source of Funding: Self

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Can Better Infrastructure Ensure Better Healthcare? The Dialectic of Assam's Health Sector Scenario

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Abstract

Health is considered as a basic asset because ill health disables us from fulfilling our responsibilities both on social and personal grounds. The objective of the paper is to access the status of health infrastructure, health facilities and expenditure pattern on health sector in the state of Assam. It tries to answer the question if the increase in the number of health care facilities is enough to ensure good health and well being of the people. The objective is fulfilled through the analysis of the secondary data collected from Statistical Hand Book of Assam on various Medical and Public Health is compared and analysed for the period mostly through tabular method. It was seen that the percentage share of Revenue Expenditure of the Government of Assam on Medical and Family Health to Revenue Expenditure of the State Govt has increased from 7.58% in 2011-12 to almost twice to 14.75% in 2017-18. Similarly the health care facilities, in terms of the number of medical institutions, medical staff and number of beds in different institutions have increased. There was a nominal decline in the birth rate as well as the death rate can be due improvement and availability of better health care facilities to the people. It was also seen that there was a decline in the fertility rates in the state of Assam. However, health is not just the physical wellbeing of an individual but also the social, emotional and cultural wellbeing of the whole community. So it's not just the health care services and expenditure on health care services that leads to good health and well-being, but also other factors like general socio-economic, cultural and environmental conditions that highly influences good health and well being of the people in a country or a nation.

Keywords: *Health Care Facilities, Health Status, Well-Being, Assam.*

Introduction

Health is perceived as one of the most important indicators of the standard of living of a country. Good health is perceived as absence of illness and is mostly associated the availability of health care facilities available in a country. Health is considered as a basic asset because ill health disables us from fulfilling our responsibilities both on social and personal grounds. It also leads to loss of man-days in jobs that will not only have an effect on the production process but will also affect the output level. As such acquiring health developments are of prime importance for the countries. Right to good health forms one of the fundamentals right and was first articulated in the Constitution of the World Health Organization in the year 1946 and also in 1948 Universal Declaration of Human Rights where health was mentioned as an important component to adequate standard of living. In the year 1966, International Covenant on Economic, Social and Cultural Rights recognized right to health as a basic human right. Thus right to health forms an elemental part of human rights which allows one to live with dignity and enjoy better standards of physical and mental health. But most often health is considered in terms of absence of illness and the availability of health care infrastructure in a country. The paper tries to show the status of health infrastructure,

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health facilities and expenditure pattern on health sector in the state of Assam. It tries to answer the question if the increase in the number of health care facilities is enough to ensure good health and well being of the people.

The paper has four sections. Section one introduces the subject matter while the second section discusses the methodology. The third section deals with the findings and discussion and the fourth section concludes the paper.

Method

The objective of this paper is sought to be fulfilled through the analysis of the secondary data collected from Statistical Hand Book of Assam. The unit of the study is the state of Assam and data on various Medical and Public Health is compared and analysed for the period mostly through tabular method.

Findings and Discussion

For the present study data on various health care facilities are discussed and compared for two years 2011-12 and 2017-18 and are presented in tabular form. But for Table 5 indicating Birth, Death, Infant Mortality Rates and Fertility Rates the data for the years 2011-12 and 2016-17 has been used due to non-availability of data for the year 2017-18.

Table 1: Outlay and Expenditure in Assam

Heads	2011-12	2017-18
Gross State Domestic Product (GSDP),At Current Price (in crore)	126,544	278,710
Net State Domestic Product (NSDP), At Current Price (in crore)	114,695	246,151
Revenue Expenditure of the State Govt., (Budget Estimate.) (in Lakh)	3,629,886	7,132,937
Capital Outlay of The Government of Assamon Medical and Family Health (in lakhs)	21,210	263,249
Revenue Expenditure of The Government of Assamon Medical and Family Health (in lakhs)	275,278	1,052,475

Source: Statistical Hand book of Assam, Directorate of Economics and Statistics Government of Assam, 2012 and 2018

As seen from Table 1 that the revenue expenditure on medical and public health in Assam is greater than the capital outlay of the government in both the years, Further it is seen that both the allotted outlay and the revenue expenditure has increased in a period of 7 years. This signifies that the health expenditure as a share of the expenditure of the Government of Assam on various heads has increased over the years. Further, the percentage share of Revenue Expenditure of the Government of Assam on Medical and Family Health to Revenue Expenditure of the State Govt has increased from 7.58% in 2011-12 to almost twice to 14.75% in 2017-18.

Table 2: Total Number of Health Care Facilities in Assam

Items	2011-12	2017-18
Civil Hospital	22	25
S.D.C.H	13	14
P.H.C.	844	946
F.R.U.	38	15
C.H.C.	103	172
Sub- Centres	4592	4644
Clinic/Poly Clinic/Nursing Home	457	257
No. of Diagnostic Centres	221	398
Tuberculosis Hospital	3	3
Leprosy Hospital	3	3
Cancer Hospital	1	1
108 (Mritunjoy) Emergency Response Service	208	380
Performance of Boat Clinic	15	15

Source: Statistical Hand book of Assam, Directorate of Economics and Statistics Government of Assam, 2012 and 2018

N.B.: S.D.C.H. = Sub Divisional Civil Hospital, P.H.C. = Primary Health Centre, F.R.U. = First Referral Units, C.H.C. = Community Health Centres

From Table 2 that the number of Civil Hospitals, S.D.C.H. and P.H.C has increased from 22 to 25, 13 to 14 and 844 to 946 respectively during the period of 7 years. Similarly, the number of C.H.Cs, sub-centres, Diagnostic Centresand 108 emergency response services has also increased during the same period of time. However the number of F.R.Us and Clinic/Poly

Clinic/Nursing Homehas fallen from 38 to 15 and 457 to 257 respectively during the same period. But the number of Tuberculosis Hospital, Leprosy Hospitaland Cancer Hospital has not increased during this period. But these diseases are of critical importance and it is more of these special care treatments come so that more people has access to these facilities.

Table 3: Total Number of Medical and Paramedical Staff in Assam

Position	2011-12	2017-18
MBBS Doctors	1568	3097
Specialist Doctor/Post Graduate Doctors	809	1125
Ayurvedic Doctor/BAMS	574	811
Dental Surgeon	101	279
Homeopathic Doctors	61	297
MBBS Doctors for 1 year rural posting	808	402
ANM	10232	12251
GNM	3759	12251
Pharmacists	1287	2089
Lab. Technician	1224	1647
Radiographer	132	155
Rural Health Practioner	157	562

Source: Statistical Hand book of Assam, Directorate of Economics and Statistics Government of Assam, 2012 and 2018

N.B.: ANM = Auxiliary Nurses Mid Wives, GNM = General Nurses Mid Wives

It is seen from table 3 that the total number of Medical and Paramedical Staff in Assam has increased in Assam from 2011-12 to 2017-18. However, the number of MBBS Doctors for 1 year rural posting has decreased during from 808 in 2011-12 to 402 in 2017-18.

Table 4: Total Number Beds in Different Health Institutions of Assam

Items	2011-12	2017-18
Civil Hospital	3030	3630
Block Primary Health Centre (BPHC)	900	900
Mini Primary Health Centre (MPHC)	2104	3460
Community Health Centres (CHC)	3330	4860
Sub-Divisional Civil Hospital (SDCH)	735	915
Medical College Hospital (MCH)	NA	5121

Source: Statistical Hand book of Assam, Directorate of Economics and Statistics Government of Assam, 2012 and 2018

From table 4 it is evident that the total number of beds in various health institutions has increased from 2011-12 to 2017-18. However the same cannot be said for the Medical College Hospitals as the data for the year 2011-12 was not available.

Table 5: Birth, Death, Infant Mortality Rates and Fertility Rates

Indicators	2011-12	2016-17	2017-18
Birth Rate	22.8	21.7	NA
Death Rate	8	6.7	NA
Infant Mortality Rate (IMR) (Per 1000 live birth)	55	44	NA
General Fertility Rate (GFR) (Per 1000 live birth)	82.8	78.2	NA
Total Fertility Rate (TFR) (Per 1000 live birth)	2.4	2.3	NA

Source: Statistical Hand book of Assam, Directorate of Economics and Statistics Government of Assam, 2012 and 2016

From table 5 it is seen that birth rate has fallen from 22.8 in 2011-12 to 21.7 in 2016-17 indicating that the birth rate has fallen nominally which could be indicative of a achievement of family welfare programme and people adopting like sterilization, usage of I.U.D etc. The death rate has also fallen during the same period from 8 to 6.7 indicating an improvement in better health care facilities available to the people. During the same period the Infant Mortality Rate has also declined from 55 to 44. The General fertility rate has also declined during the same time. But the total fertility rate during the same period has remained more or less the same indicating a reduction by only 0.1.

From the discussion it is seen that The percentage share of Revenue Expenditure of the Government of Assam on Medical and Family Health to Revenue Expenditure of the State Govt has increased from 7.58% in 2011-12 to almost twice to 14.75% in 2017-18. Similarly the health care facilities, in terms of the number of medical institutions, medical staff and number of beds in different institutions have increased. A nominal declined birth rate could be indicative of an achievement of family welfare programme and people adopting like sterilization, usage of I.U.D etc. The fall in the death rate can be due improvement and availability of better health care facilities to the people. A decline in the fertility rates could be an impact of the level of education of women in the state of Assam. Women who are more educated, o an average, will tend to have fewer children than women who are not.

Conclusion

However health in its broadest sense means a

person's level of good physical and mental health, which individuals in a society to live healthy and flourishing lives. According to Aboriginal Health and Medical Research Council of New South Wales, Australia, "Health is not just the physical wellbeing of an individual but also the social, emotional and cultural wellbeing of the whole community, in which each individual is able to achieve their full potential as a human being, thereby bringing about the total wellbeing of their community". So it's not just the health care services and expenditure on health care services that leads to good health and well-being. But according to Dahlgren and Whitehead other factors like general socio-economic cultural and environmental conditions like age, sex, unemployment, water and sanitation, housing, agriculture and food production, education, work environment, living and working conditions, social and community networks that highly influences good health and well being of the people in a country or a nation.

Ethical Clarence: It is review article based on secondary data collected from Statistical Hand book of Assam, Directorate of Economics and Statistics Government of Assam

Source of Fund: Self.

Conflict of Interest: Nil

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Study the Link between Laparoscopic Cholecystectomy and Abdominal Wall Paraumbilical Hernia

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Abstract

A laparoscopic cholecystectomy is a surgery which includes the removal of gallbladder. It is a minimally invasive cholecystectomy wherein inside of the abdomen is visualize with the help of camera introduced through 4 small incisions to remove the gallbladder by using long tools. The aim of the present study is to evaluate the correlation between abdominal wall hernia (paraumbilical hernia) and laparoscopic cholecystectomy in the Iraqi patients (n=100). The age of the patients was 25 to 36 years. Before surgery, the red blood cells, white blood cells and serum urea were found to be 105.67±3.00; 13731±1940.4 and 33.48±0.47, respectively. After surgery, the red blood cells, white blood cells and serum urea were found to be 117.95±4.21; 10307.9±1057.7 and 35.25±0.46, respectively. The laparoscopic cholecystectomy with previous abdominal wall hernia is the easiest operative procedure. However, it required good experience and careful dissection.

Keywords: *Abdominal wall paraumbilical hernia, Surgery, Laparoscopic cholecystectomy.*

Introduction

Various factors such as alterations in medications, hormones, diet, or rapid weight gain or loss results in changes in concentration of bile; which helps in the digestion into the small intestine and produced by the liver. Formation of gallstones occurs if the bile composition and concentration is changed. If this formed gallstones migrate out of the gallbladder then it blocks bile normal flow and develops infection and inflammation. This is known as cholecystitis and its symptoms are constant abdominal pain, vomiting, fever and nausea[1]. The incidence rate of gallstones is 10-15%. Out of these, about 35% of patients display lifetime recurrence rate of symptoms or complications. Gallstones are three times more common in women than men[2].

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To prevent associated inflammation complications, administer conservative therapy is used which is a first line of acute cholecystitis treatment. If patients do not respond to medication after 6 to 8 weeks of treatment, laparoscopic cholecystectomy is performed. About 70% of such patients respond to medical therapy within the first 24 to 48 hours; still laparoscopic cholecystectomy is the preferred treatment for symptomatic gallstone disease[1].

In rare cases, complications after laparoscopic cholecystectomy are observed and could become serious if structures near the gallbladder are damaged. Common bile duct is one of situated near gallbladder; which pores bile from the gallbladder and liver into small intestine. Biliary ducts damage or leakage leads to the barrier of bile flow and develops symptoms of fever, abdominal pain, and yellowing of the skin. This is known as jaundice. Gallstone disease also showed similar symptoms along with the bleeding from a blood vessel. Generally, bleeding stops after some time. However, if it's persistent for a long time, then intervention isneeded. Post cholecystectomy surgery, fever, nausea, worsening pain, chills, vomiting, or jaundicealso reported by some authors[1].

Another complication of laparoscopic cholecystectomy is the occurrence of port site hernia. The incidence rate of it deceits between 0.38% to 5.4% with an overall frequency of 1.7%. The incidence rate is increasing with size of the trocar. The incision enlargement, connective tissue disorders, diabetes mellitus, wound infection, type of trocar used, obesity, and defective closure of the fascial defect. These are the major risk factors involved in the development of port site hernia[2,3]. Sometimes, peritoneal defects below the repaired fascial layer could lead to herniation. Therefore, it is important to safely repair the port sites; fascial as well as the peritoneal. With this background, we aim to evaluate the correlation between abdominal wall hernia (paraumbilical hernia) and laparoscopic cholecystectomy.

Material and Method

Patient Enrollment: In the present study, the patients (n=100) visited to the Baqubah teaching hospitalduring July 2018 to July 2019 were enrolled. The age of the patients was 25 to 36 years.

Inclusion Criteria:

1. All cases with symptomatic gall stone disease
2. Acute cholecystitis after conservative treatment
3. Diabetics patient with gall stone
4. A calculus cholecystitis

Operative procedure: All operations are done under general anesthesia, in supine position and insufflation with CO_2 by using Veres needles or Hason method in patient with complicated previous abdominal surgery. Dissecting the calot triangle and identification and clippings of both cystic artery and duct.

Blood Collection: The blood was collected for the various biochemical assays such as hematogram analysis and serum urea by commercially available kits.

Statistical Analysis: Results were presented as mean ± standard error (SE). Dunnett multiple comparison test and one way analysis of variance (ANOVA) was done to estimate the statistical significance.

Results

In the present study,we examined the hundred patients visited to the Baqubah teaching hospital during July 2018 to July 2019 period. The age group of the patients was 25 to 36 years.

Before surgery, the red blood cells, white blood cells and serum urea were found to be 105.67±3.00; 13731±1940.4 and 33.48±0.47, respectively. After surgery, the red blood cells, white blood cells and serum urea were found to be 117.95±4.21; 10307.9±1057.7 and 35.25±0.46, respectively (Table 1).

Table 1: Blood parameters before and after surgery

Blood Parameter	Before	After
Red Blood Cells	105.67±3.00	117.95±4.21*
White Blood Cells	13731±1940.4	10307.9±1057.7
Serum Urea	33.48±0.47	35.25±0.46

Discussion

Various studies have investigated laparoscopic cholecystectomy and associated complications such as incisional hernia from umbilical port[4-12]. In the present study, we have evaluated the hematological parameters and serum urea before and after hernia surgery. In a case study of 55 year old female reported by Sharma et al.[13]an anterior abdominal wall hernia was diagnosed after two days of laparoscopic cholecystectomy through the umbilical port. Authors have reported hernia reduction, fascial anatomical repair and peritoneal defect over the midline laparotomy incision[13].

Umbilical hernia is another type of hernia constituting 6% of all abdominal hernias in adults[14,15]. Treatment options for umbilical hernias includes several surgical method. During laparoscopic cholecystectomy; the simultaneous occurrence of umbilical hernia and cholelithiasis may cause technical problems in CO_2 insufflations and trocar insertion. Kamer et al.[16]has explored ideal repair method among primary repair, mayo repair and flat mesh hernioplasty for incidentally encountered umbilical hernias after laparoscopic cholecystectomy. The study reported improved outcomes of the umbilical defect repair with mesh after laparoscopic surgeries and a better technique for either obese or non-obese patients than primary suture techniques in terms of recurrence rates[16].

In a case control study by Uslu et al.[17], female gender, older age, higher BMI along with increased surgery duration was found to be associated with increased probability of a trocar site hernia formation. Thus, authors conclude that closure of trocar sites in obese patients above 60 years, and a longer operation duration could result in prevention of port site hernia following laparoscopic cholecystectomy[17].

Thus, during the follow up of patients who underwent laparoscopic cholecystectomy; after this surgery, the probability of development of port site hernia can occur. These considerations of hernia could help in providing early intervention to reduce sepsis and strangulation. In addition, repair of both peritoneal and fascial layers at the port site should also be considered to avoid such unfavorable condition at a future date.

Conclusion

The laparoscopic cholecystectomywith previous abdominal wall hernia is the easiest operative procedure. However, it required good experience and careful dissection. The red blood count gets increased after surgery along with serum urea.

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Acute Head Injury with Pregnancy

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Abstract

Introduction: Trauma affects 7-8% of all pregnancies. A multidisciplinary management of pregnant patients with traumatic brain injury is required, The efforts of the Neurosurgeon, Gynaecologist and Anaesthetist/ Intensivist is mandatory. The management is individualized as per the foetal status, gestational age, and maternal injury score.

Materials and Method: We studied 8 patients who were operated for severe head injuries with pregnancy. The main aim of the study was to know the outcome of pregnant females and the neonate in head injury.

Results: The maternal outcome depends solely on the grade and type of the head injury, the fetal outcome depends upon the age of the pregnancy and maternal GCS.

Conclusion: Best management of the maternal and the foetus is achieved with multidisciplinary approach of team. The utmost important is the decision which needs to be taken as early for the low to moderate GCS patients.

Keywords: *Caesarean section, craniotomy, pregnancy, traumatic brain injury.*

Introduction

Trauma affects 7-8% of all pregnancies[1,2] and is becoming the most frequent cause of maternal mortality in the underdeveloped and the developed countries, Head injury is the main cause of the maternal death[3,4,5,6.] Indian stats points that, Assam with the highest [237] MMR and the Maharashtra with the minimum MMR [61] with MMR in India as 130 in the year 2014-2016. Traumatic brain injury is the major contributing factor in non-obstetric mortality in developing countries. Approximately 20% of maternal mortality is directly correlated to such injuries. Road traffic accidents and domestic violence are the most common nonlethal injuries that can threaten either the maternal or foetal life, and such events occur in 1 out of every 12 pregnancies.[3,4] The physiological changes in pregnancy progresses needs several specific considerations in the management of severe traumatic brain injury Head injury causes rapid rise of intracranial pressure which leads to hypotension resulting in the poor fetal outcome[5,6]. The team approach is required for successful outcome of both mother and neonate. Because the most common cause of fetal death is maternal death, so the mother must be resuscitate firstly. Any trauma victim of childbearing age must be considered pregnant until proven otherwise. This is important because most of severely injured patient may not be able to communicate. It is recommended that pregnancy test should be performed in all patients.[7] Pre-hospital Care is utmost important as oxygen supplementation is essential for both the mother and

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foetus for the prevention of hypoxia. Prompt positioning the patient in the left lateral decubitus position should be done to avoid compression of the venacava, resulting in hypotension. Hypoxia and hypotension have detrimental effects on both lives, as these conditions are associated with approximately 50%–75% of mortalities. In general, treatment that is good for the mother is good for the foetus. In cases of major trauma, the assessment, stabilisation and care of the pregnant women is the first priority; then, if the foetus is viable (≥ 24 weeks) foetal monitoring is initiated. The standard guidelines for the management of traumatic brain injury can be applied to pregnant patients. If neurosurgical intervention has been performed in early pregnancy (< 24 weeks), the decision about subsequent foetal management can be based on obstetric considerations Based on the Brain Trauma Foundation 2016 guidelines, a variety of measures to control intracranial pressure can be administered, such as a *slight head-up position, low tidal volumes during intermittent positive pressure ventilation and avoidance of vomiting*[8]. Administration of mannitol in pregnant women should involve caution, as it slowly accumulates in the foetus, causing foetal hyperosmolality; this will lead to physiological changes, such as reduced fetal lung fluid production, reduced urinary blood flow and increased plasma sodium concentrations.[9,10] However, in individual case reports, mannitol in doses of 0.25–0.5 mg/kg has been used and appears beneficial. Post-operative care in the intensive unit for pregnant women involves maintaining neurological and systemic homeostasis. There is an increased risk of both deep venous thrombosis and pulmonary embolism due to alterations in clotting factors in pregnancy, as well as endothelial injury secondary to trauma and susceptibility to infection.

Materials and Method

The study was conducted at medical college for a period of 2 years and the patients belonged mainly from Amballa, Yamunanagar and Saharanpur districts. Only the patients with severe head injury with pregnancy in the third trimester were included in the study. 8 patients with third trimester pregnancy of severe head injury were operated. Different variables were studied. The main aim of the study was to know the outcome of head injuries in the pregnant females and fetal outcome.

For all the patient we formulated multidicipilinary approach which consisted of neurosurgeon, obstetrician, intensivist, neonatologist and Anesthetist. All the patients underwent primary survey then were stabalised with oxygen and fluid resuscitated, basic investigations and NCCT head with lead apron was done, Focused assessment with sonography for trauma examination and cervical spine radiography were done Obstetric examination utilizing ultrasonography and cardiotocography were done. After discussing the risks and benefits with patient's family, the patients were immediately taken up by the gynaecologist for C section, and subsequently operated by us for craniotomy and postoperatively the patient was kept on ventillatory support and subsequently managed accordingly. The baby was handed over to the neonatologist with the view that neonates born by CS with general anesthesia are at increased risks with 1- and 5-minute Apgar scores of less than 7 and needs resuscitation.

Observations and Results

The mean age of the patients was 31 years (22-41 years .Three patients were primigravida and five were multigravida. The GCS of the patient ranged between 5/15 to 12/15

Three patients had anisocoria at the time of presentation. All the patients were taken up for C section and APGAR score was assessed The APGAR score of the patients were low in our study calculated a 1 min and 5 min {Table 1}. The weight of the babies was assessed and was managed accordingly, one patient with 28 weeks of the pregnancy had GCS of 6/15 whom presented with abruptio placenta, the weight of the baby was only 1100 grams.(The baby could not be resuscitated). The average time taken from the trauma to the surgery was 78 min {45min-180 min}. Over all the blood loss in the craniotomy {pregnant patients } was more than usual craniotomies (non-pregnant patients) which was assessed with assessed with blood transfusion and blood loss blood.

In our study out of eight patients two (25%), these patients presented with acute SDH and had low GCS of 5 and 6 out of 15.

Four (50%) babies out of eight had died, their weight were 1100 grams, 1600 grams, 1628 grams and 2720 grams, the patient with fetal weight of 2720 presented and operated late after 3 hrs of injury and had lowest GCS of 5/15 she was multigravida and maximum age of 41 years in the study, she also died on the 3rd postoperative day.

2 patients developed deep venous thrombosis, they were managed conservatively and had good outcome later on. One patient had abruptio placenta .

Two of the eight patient had a poor outcome and died, all the 6 patients were kept in the neuro icu and was managed and had good out come with min morbidity and were functional.

Description of the patients are listed in the table no 1:

Case 1: Thirty two years female G2P1, 34 weeks of pregnancy presented, On examination, she was breathing spontaneously (respiratory rate of 30 breaths/min.) Her BP was 120/80 mmHg, heart rate was 98 beats/min, Glasgow coma score was 7\15 (E1, V1, M5) The patient was intubated in view of low GCS . NCCT head done revealed large acute left frontotemporal SDH with midline shift of 8 mm with right temporal bone fracture. No other injuries were clinically detected. FAST and C SPINE radiography were normal. Obstetric examination utilizing ultrasonography and cardiotocography revealed a 34 weeks viable fetus with good biophysical profile, with no signs fetal distress. After discussing the risks and benefits with patient's family, we decided to perform caesarean delivery followed by craniotomy. 200 ml of mannitol was infused after which the GCS improved to 10/15. The patient was immediately taken up by the gynaecologist for C section,{earlier history of C-Section because of foetal distress} and subsequently operated by right frontotemporoparietal decompressive craniotomy with removal of the hematoma with lax duraplasty, postoperatively the patient was kept on ventillatory support and subsequently was weaned off on the 5th postoperative day. The baby's weight was 2,380 g and Apgar score at 1 min was 7 and at 5 min it was 8. Female was kept on the ventillatory support for 9 days and weaned off and was managed in the NICU for 3 weeks and was later discharged and was healthy.

Case 2: Twenty seven years female G1P1 with 36 weeks of pregnancy presented with GCS of 9/15, On examination, she had shallow breathing (respiratory rate of 40 breaths/min irregular.) Her BP was 90/46 mmHg, heart rate was 118 beats/min urgent. NCCT revealed large right FTP acute SDH with effacement of the ventricles, Obstetric examination utilizing ultrasonography and cardiotocography revealed bradycardia. Immediately the patient was intubated, after discussing the risks and benefits with patient's family and the gynaecologist, Urgent C-Section was taken up by gynaecologist The weight of the baby was 2.700 gms and had an APGAR score of 9 at 1 min and 10 at 5 min, the baby was shifted to the NICU and simultaneously decompressive craniotomy was done on the right frontotemporoparietal region, a large hematoma was evacuated and the hemostasis was achieved, closed with lax duraplasty, the bone was kept in the left side of the abdomen subcutaneously, postoperatively the mother was kept on ventillatory support for 24 hrs and then weaned off and the baby did well without any support.

Case 3: Twenty two years female, G1 P1 with 37 weeks of pregnancy had head injury when she fell off from the bike, on examination her pulse was 66/m, BP was 110/70 mmHg with 10cm x 2 cm lacerated wound on the left temporal region with GCS of 12/15 with labour pains, on examination the patient had anisocoria with left pupil 3mm reacting and right pupil 2 mm reacting to light. Foetal USG done for foetal well being was normal with good biophysical profile, with no signs fetal distress. NCCT revealed large acute left temporoparietal SDH. Maternal examination revealed cervical dilatation of 4 mm and gynaecologist in consultation with neurosurgeon opted for early C-section. The patient was operated, the mother was off ventillatory support on the 2nd postop days and the baby did well with APGAR score of 10.

Table 1. Description of the patients showing their age, gravida, tenure of pregnancy, GCS, weight of baby, APGAR score and the outcome

No	Maternal Age (Years) and Gravida		Gestation age (weeks)	Type of head injury	GCS on arrival	Pupils	Weight of baby (grams)	APGAR score at		Timing between injury and surgery (min)	Baby admission to NICU	Maternal Outcome	Outcome of baby
								1 min	5 min				
1	32	G2P1A0	34	Left FTP SDH with temporal contusion	7/15	Anisocoria	2380	7	8	45	Yes	Good	Good
2	27	G1P1A0	36	Right FTP SDH	9/15	Normal	2700	9	10	60	Yes	Good	Good
3	22	G1PlA0	37	Left Temporoparietal SDH	12/15	Anisocoria	2830	8	10	70	No	Good	Good
4	38	G3P2A1	28	Left Parietal EDH	6/15	Anisocoria	1100	4	5	60	Yes	Good	Poor [died]
5	28	G1P1A0	32	Right SDH with frontal contusion	12/15	Normal	1628	6	7	50	Yes	Good	Poor [died]
6	41	G5P2A2	37	Left temporal SDH with SAH	5/15	Anisocoria	2720	3	4	120	Yes	Poor [died]	Poor [died]
7	25	G2P1A0	31	Left hemispheric SDH	6/15	Anisocoria	1600	5	9	180	NAD	Poor [died]	Poor [died]
8	36	G3P2A0	39	Right FT SDH with occipital contusion	7/15	Anisocoria	2742	10	10	40	No	Good	Good

Discussion

Severe head injury in the pregnancy is common ranging between 7-8 %, most common the patients are the pillion riders. An intensive multidisciplinary approach are required for survival of mother and neonate. The higher chances of mortality are associated with pregnancy as the physiology of the body is changed. There is increase in the blood volume by 40% and inspite of that there is dilution as the RBC increase only by 25% which lead to physiological anaemia resulting increased loss of the blood without showing the features of shock, endangering risk of life to mother and the neonate. The position of the uterus in supine position can cause hypotension. Sudden hypotension in the patient can lead to decreased fetal circulation and leading to poor fetal outcome. Increased levels of coagulation factors may improve hemostasis after trauma; whereas two of our four 2 patients developed DVT because pregnancy causes increased risk of thromboembolic complications during periods of immobilization.

When neurosurgery is indicated urgently during pregnancy, general anesthesia is almost always indicated which have deleterious effects on the neonatal oucome and the APGAR score. During the third trimester, patient may be suitable for initial cesarean delivery, followed by the neurosurgical procedure, using an appropriately modified anesthetic technique.[12] Positioning needs head elevation for the neurosurgery, whereas a lateral tilt is required for the avoidance of aortocaval compression and reduced venous return. The presence of a potentially full stomach, pregnancy induced changes in the airway and enlarged breasts, which increase the incidence of a difficult intubation.[13] A rapid sequence induction with cricoid pressure is advocated despite airway management being more difficult. A pregnant woman is no more pre-disposed to head injury than a non-pregnant one. However, because of the physiological, hormonal, hemodynamic and anatomical changes associated with pregnancy, certain standard neurosurgical practices may be challenged. Thus, close communication and constant discussion between the neurosurgeon, Neuroanesthetist, obstetrician and the patient's family is essential. The average blood loss using visual estimation in the C section is around 470±221 ml with a range of 200-1100 ml[14,15]. In our study the average loss at the time of C section was 592±222ml which slightly higher than some studies and was within range of most of the studies[16] . Our study showed that the total blood loss per patient was 3.6 units to 4.4 units Estimated blood loss is the approximate amount of blood loss after craniotomy surgery, calculated by the formula:

Estimated blood loss = Hb(pre-op) - Hb(post-op) + blood transfusion unit used during surgery.

Most of studies showed average loss of blood in craniotomies[17,18] of around 4 units, our study is consistent with the same. Above all, it is a challenge in team work and communication between all parties concerned in the patient's care.The decision for the conservative management is unlikely to have the better outcome as in case of the maternal mortality, the time span for C-Section is very less {4 minutes}. The patient is thoroughly examined by The Rapid Assessment Several cases have reported of successful pregnancy outcomes after severe brain injury during pregnancy if managed conservatively, where mother could not be saved or she continued to be in comatosedor in vegetative stage.

Conclusion

Best management of the maternal and the foetus is achieved with multidisciplinary approach of team. Advances in neonatology, neurosurgery, critical care, easy approach to the tertiary hospital enhance the chances for maternal her fetus to survive. The utmost important is the decision which needs to be taken with the consent with the family informing all the risks to the patient and the neonate.

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Effectiveness of Deep Brain Stimulation in Parkinsonism

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Abstract

Introduction: Deep brain stimulation (DBS) is a neurosurgical procedure indicated for patients with advanced Parkinson's disease (PD).This study aimed to investigate the relative efficacy and safety of DBS when medical therapy is ineffective in advanced PD.

Material and Method: 50 patients whom were on medical treatment for long and started to have side effects of the drugs were the part of the study to find the improvement in the status in terms of tremors, dyskinesia and rigidity.

Results: Preoperatively and postoperatively comparison in the improvement was done which revealed, improvement was 75%, 61.5% and 58 % respectively in tremors, rigidity and dyskinesia. There was statically significantly improvement rigidity, tremor and the dyskinesia, the patients needed smaller doses of the medications and showed less signs of distress.

Conclusion: Our results clearly suggested that with Deep Brain Stimulation patients showed significant improvement with decreased dose of medication.

Keywords: *DBS; Parkinsonism rigidity, dyskinesia and tremors, response of DBS on STN.*

Introduction

Parkinsonism is the detected in early 19th century, In the 1970's it became evident that long term levodopa treatment eventually could have disabling complications such as levodopa induced dyskinesias[1] . Hence, there was a need to find an alternative method to ablative surgical method, without irreversible side-effects. This resulted in the reappearance of DBS in the treatment of movement disorders. The pioneering work started in 1987 and was led by Alim-Louis Benabid and Pierre Pollak[2]. Deep brain stimulation (DBS) for Parkinson's disease, started in 1987 when two group[2,3] reported results of chronic thalamic stimulation for parkinsonian tremor with nearly all patients having significant tremor suppression. The aim of this study was to compare the clinical outcomes of advanced PD patients following bilateral STN DBS,Electrode was passed The final positioning of the electrode checked by impedance monitoring, depth recording, and elicitation of evoked potentials and stimulation of presumed target. Parkinson's disease (PD) is a progressive and debilitating neurodegenerative disorder that affects 0.1 - 0.2% of the population at any time and 1% of the population over 60 years old, with the prevalence increasing in an age-dependent manner, Clinically, it is characterised by motor (tremor, rigidity, and bradykinesia), autonomic(constipation and orthostatic), and neurocognitive impairment (depression or sleep disorders.).

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Materials and Method

This treatment was carried out at the Neurosurgery department. 50 patients of Parkinsonism were studied.

Inclusion criteria were: a diagnosis of idiopathic Parkinson's disease, age 30-75 years, good levodopa response, severe drug induced dyskinesia, Exclusion criteria were patients with pacemaker; patients with significant depression, and psychotic symptoms. The final targets achieved MRI brain were finalised with MER. ***Study design.*** For calculating the co-ordinates, MRI of the brain in stereotactic format was performed,later applied the frame and then CT brain was performed. Well-established Cartesian (x, y, and z) target coordinates, relative to the mid-commissural point were used for planning electrode placement by frame link by Brain lab software Figure 1. Stereotactic target coordinates were discerned from frame link software that merges the MRI of the patient's brain with a brain atlas using plain CT.[figure 2] Positioning of the electrodes in the brain and final position of the target is checked by electrode checked by impedance monitoring, depth recording, and elicitation of evoked potentials and stimulation of presumed target. [Figure 3 and 4].

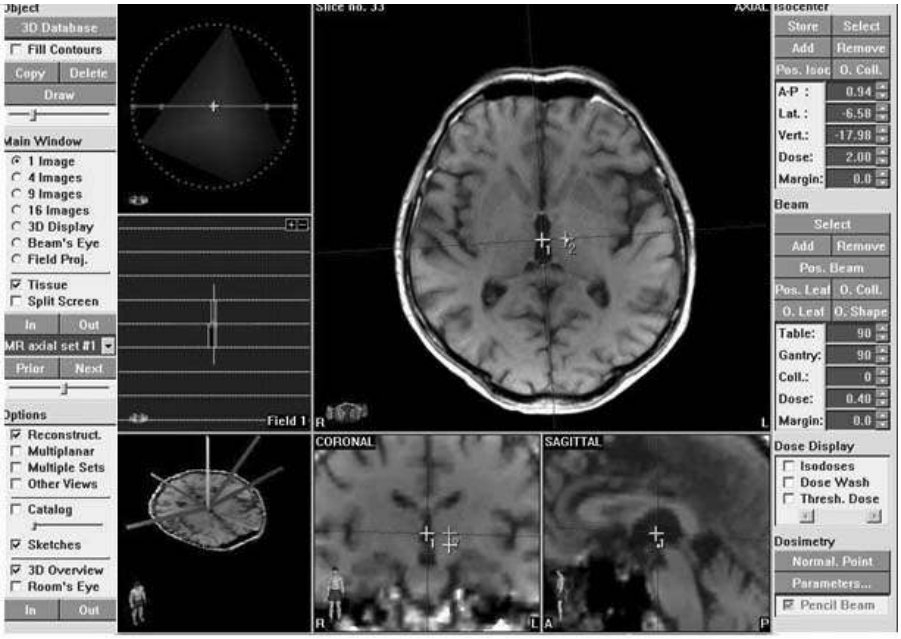


Figure 1. Localising the target and getting the coordinates with MRI brain.

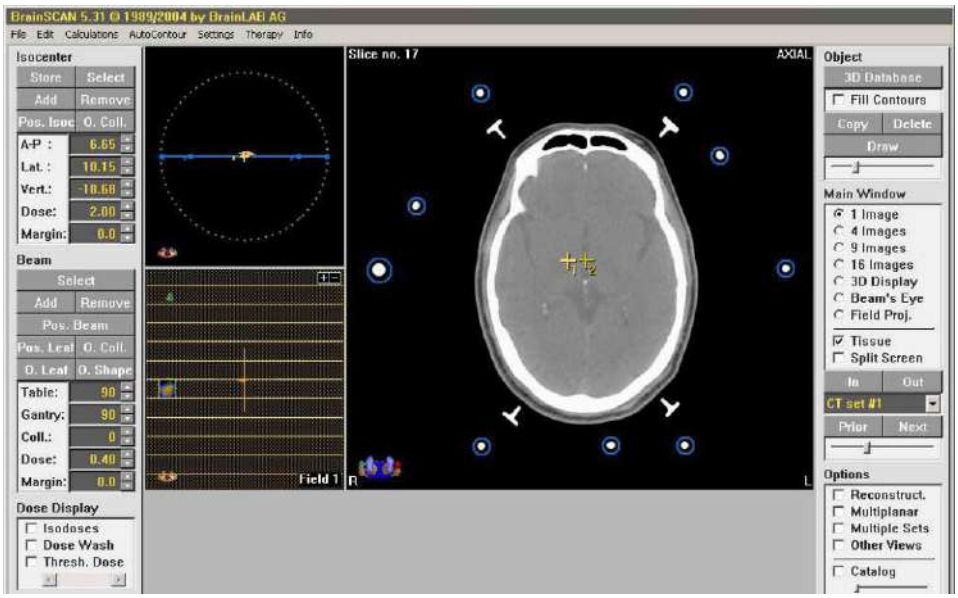


Figure 2 CT scan images used for merging in the frame link software

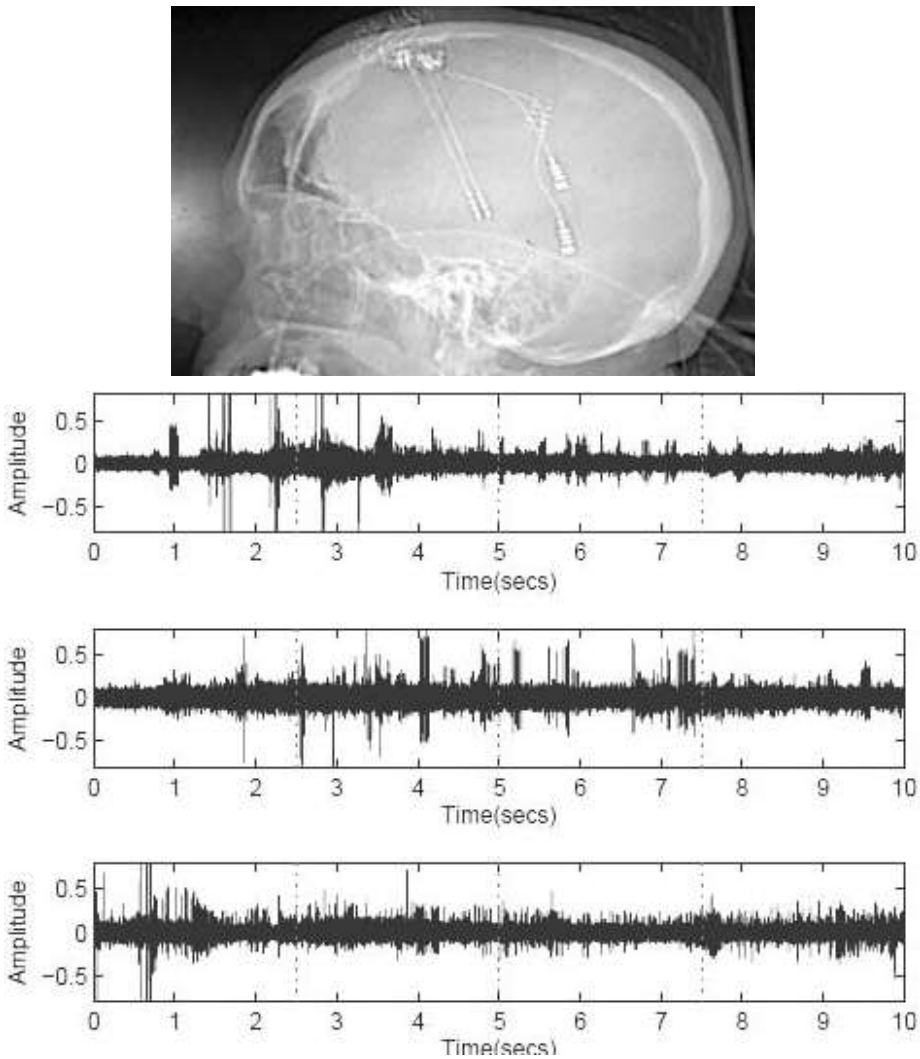


Figure 3 & 4 Positioning of the electrodes in the brain and final position of the target is checked by electrode checked by impedance monitoring, depth recording, and elicitation of evoked potentials and stimulation of presumed target.

STN stimulation: Out of 50 patients in the 36 patient were bilaterally stimulated and 14 patients were unilaterally stimulated assessing the side of the disease. In total 86 targets were stimulated.

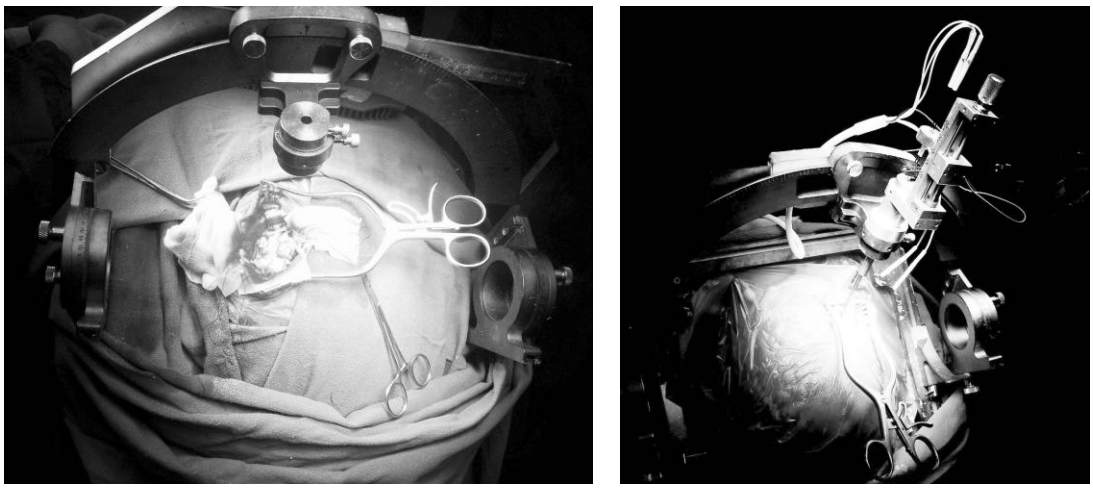
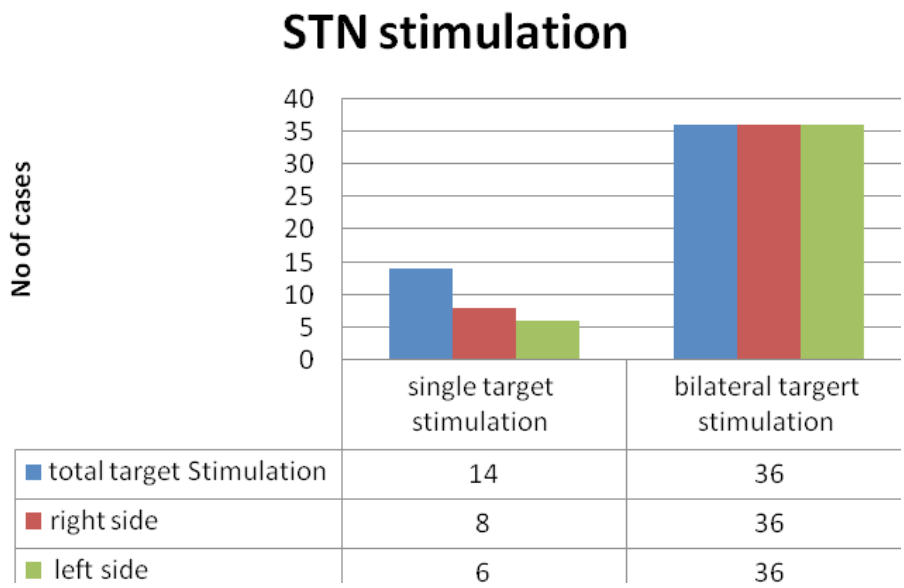


Figure 5 Intraoperative electrodes placement



Gender: Out of 50 patients 10 (20%) were female and 40 (80%) patients were males. The frame used is fixed to the patient under local anaesthesia.

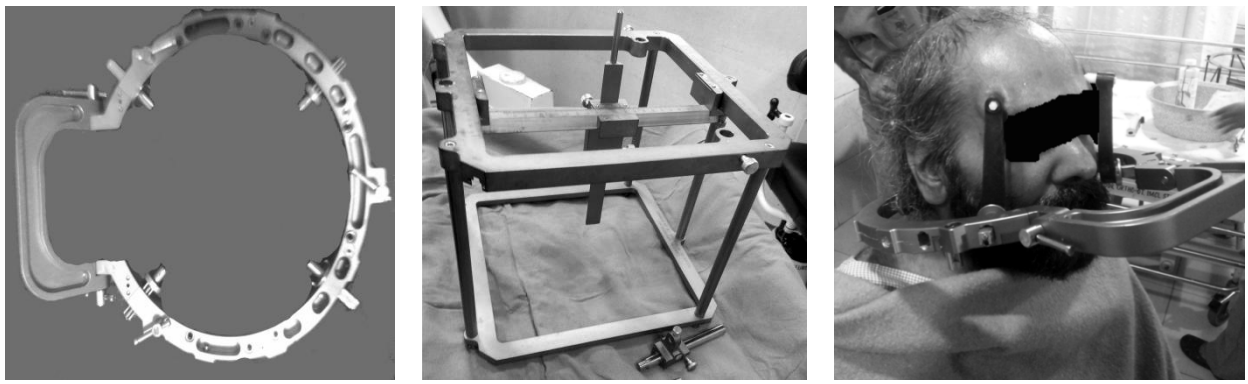


Figure 6 shows . Arc of the frame with phantom base and picture of the frame fitted to the patient

Clinical rating scales. The clinical improvements of the patients were studied preoperatively and postoperatively accordingly to the UPDRS score. The Unified Parkinson Disease Rating Scale (UPDRS) is designed to monitor Parkinson Disease disability and impairment[3].

The Unified Parkinson Disease Rating Scale (UPDRS) is designed to monitor Parkinson Disease disability and impairment.

It measured the following levels:

0 = Absent.

1 = Slight and infrequently present.

2 = Mild in amplitude and persistent. Or moderate in amplitude, but only intermittently present.

3 = Moderate in amplitude and present most of the time.

4 = Marked in amplitude and present most of the time.

The UPDRS consists of 4 different parts:

1. **Mentation, Behavior and Mood**
    1. Intellectual Impairment
    2. Thought Disorder
    3. Depression
    4. Motivation/Initiative
2. **Activities of Daily Living** (for both "on" and "off")
    1. Speech
    2. Salivation
    3. Swallowing

4. Handwritting
5. Cutting food and handling utensils
6. Dressing
7. Hygiene
8. Turning in bed and adjusting bed clothes
9. Falling
10. Freezing when walking
11. Walking
12. Tremor
13. Sensory complaints related to parkinsonism

3. Motor Examination

1. Speech
2. Facial Expression
3. Tremor at rest
4. Action or Postural Tremor of hands
5. Rigidity
6. Finger Taps
7. Hand Movements
8. Rapid Movements of Hands
9. Leg Agility
10. Arising from Chair
11. Posture
12. Gait
13. Postural Stability
14. Body Bradykinesia and Hypokinesia

4. Complications of Therapy (In the past week)

1. A. Dyskinesias

1. Duration: What proportion of the waking day are dyskinesias present?
2. Disability: How dialing are the dyskinesias?
3. Painful Dyskinesias: How painful are the dyskinesias?
4. Presence of Early Morning Dystonia

2. B. Clinical Fluctuations

1. Are "off" periods predictable?
2. Are "off" periods unpredictable?
3. Do "off" periods come on suddenly, within a few seconds?
4. What proportion of the waking day is the patient "off" on average?

3. C. Other Complications

1. Does the patient have anorexia, nausea, or vomiting?
2. Any sleep disturbances, such as insomnia or hyper somnolence?
3. Does the patient have symptomatic orthostasis?

Complications: Complications were classified into operation-related, hardware-related and stimulation-related.

Operation-related complications included:

1. Intracranial hemorrhages,
2. Neurological deficits,
3. Venous infarct,
4. Venous air embolism,
5. Seizures
6. Electrode malposition,
7. Pulmonary embolism.

Hardware-related complications included

1. Fracture of electrodes,
2. Electrode migration,
3. Infection,
4. Erosion.

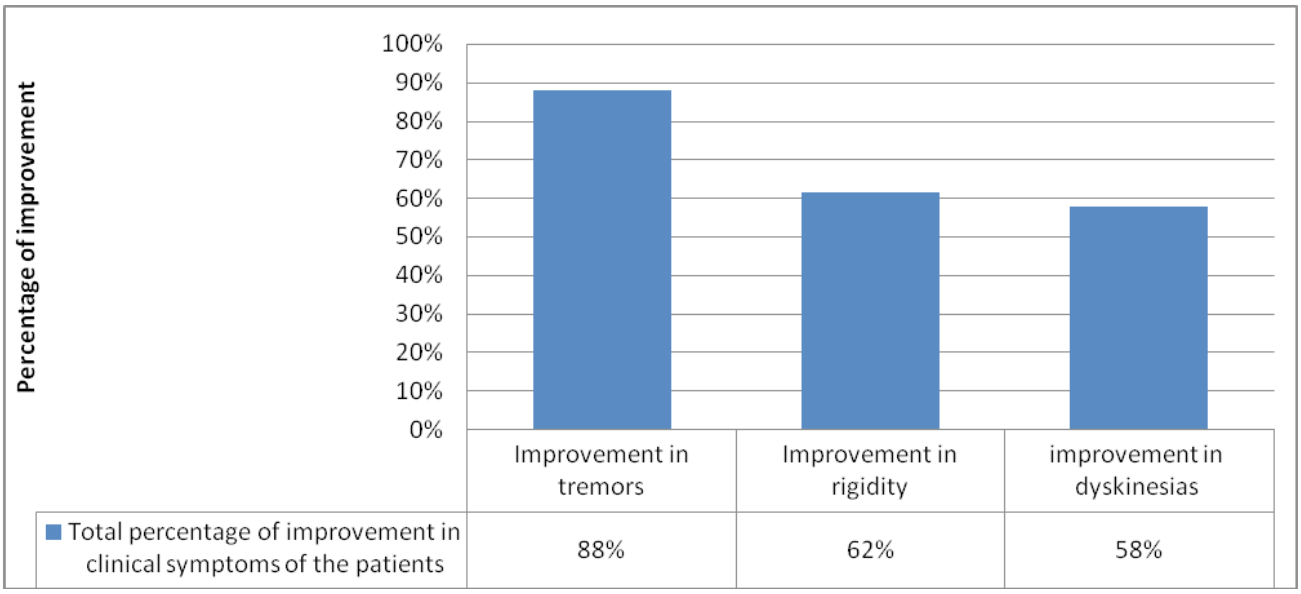
Stimulation-related complications included

1. Sensorimotor conditions,
2. Psychiatric conditions,
3. Life-threatening conditions.

Statistical significance: Statistical analysis of the data was performed by using Statistical Package for the Social Sciences Version 20 SPSS version 20, Paired T Test, Wilcoxon signed rank test and by R software with KW Test, Mann Whitney and t-stat,To indicate statistical significance p value<0.01 for paired t test and <0.05 for Wilcoxon signed rank test, KW Test, Mann Whitney and t-stat was taken.

Results

Comparisons of the results were done on the basis by grading the tremors, rigidity and dyskinesias with grade of 0-4 on clinical examination pre and postoperatively. The score obtained was calculated was calculated in percentages and was correlated with scoring system and the outcome was measured.



Comparison of tremors in the patients preoperatively and postoperatively

Discussion

The improvement in the clinical symptoms of the patients of DBS at subthalmic nucleus were studied in 50 patients, Overall the surgery was well tolerated, with the exception of three patient developed bleed {one thalamic bleed and 2 cortical }; the patient was managed with conservative treatment with medications and mannitol was given in one. The target of the subthalamic nuclei[4-6] were the closest to the final target, confirmed by microelectrode recording[5, 7], as similarly reported, visual target as possibly more accurate [7-10] An accuracy of 84.76 % was achieved in localising the subthalamic nuclei, confirmed with microelectrode recording. Patients achieved the best results in Unified Parkinson's Disease Rating Scalescores in both "on and off" state[11]. The improvement in rigidity, tremor and the dyskinesia due to subthalamic nuclei stimulation correlated well with the improvement of the other sensory and motor parkinsonian symptoms[13]. A trajectory of 50˚-60˚was used[13], which correlated with the alignment of the subthalamicnuclei. The best results were achieved in the dorsolateral portion of the subthalamic nuclei[14,15,16]. The ventral portion of subthalamic nuclie which was better visualised in the magnetic resonance imagingis associative areas and has connections with the limbic system[17].

It is likely that there were several unavoidable errors in this study e.g positions of the electrodes while fusing magnetic resonance imaging/computed tomography, direct visualisation of subthalamic and inter-evaluator errors, and errors in plotting the electrodes in the brain atlas based on the fused images[18,19]. Secondly there are distortions in the magnetic resonance imaging which may lead the displacement of the targets[18]. Thirdly it is rare that all the borders of the subthalamic nuclei are not visualised with precision, Systematic reviews and meta-analyses of randomized controlled trials comparing DBS to the best medical therapy are limited. Perestelo-Pérez et al.[20] showed that DBS was superior to BMT for improving motor control, QoL, and medication doses in PD patients. Finally, the long-term outcome of the patients who underwent programming after subthalamic nuclei deep brain stimulation needs to be assessed. Hitti FL et al in their study of DBS for PD showed 10-year survival rate of 51%. Survey data suggest that while DBS does not halt disease progression in PD, it provides

durable symptomatic relief and allows many individuals to maintain ADLs over long-term follow-up greater than 10 years[21].

Conclusions

There has been Substantial improvement in the quality of life in the patients who had DBS with medical therapy, we found that tremors and rigidity had significant improvement the compliance was better and significantly decreasing medication costs. The only drawback in the developing country was that the expense of the procedure (10-15 lakh) makes the procedure unreachable to the middle class patients . The efficacy of DBS has been established.he efficacy of DBS has been established, yet the question remains as to whether DBS should be considered as a treatment option at an earlier stage than the current recommendations.

Ethical Clearance: Taken from Indraprastha Apollo Hospital Delhi ethical committee

Source of Funding: Self

Conflict of Interest: Nil

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Significance of PD-L1 Expression and Tumor Infiltrating Lymphocytes in High Grade Serous Ovarian Cancer: Egyptian Experience

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Abstract

We aimed in this study to detect the correlation between PD-L1 and TILs, and their relationship with clinical outcome and survival in Egyptian patients with HGSOC.

Immunohistochemical expression of PD-L1, CD4 and CD8 was investigated in 94 HGSOC Egyptian patients. PD-L1 immunoreactivity was detected in 24% of the cases. The lack of tumor PD-L1 expression proved to be an independent predictive factor for better overall survival (OS) (p= 0.01). Moreover, high stromal CD8+ TILs density had a significant impact on better disease-free survival (p=0.007). Patients who showed negative expression of PD-L1 and high intraepithelial CD8+ TILs density lived significantly longer than other patients (p- 0.021).

Keywords: *PD-L1, HGSOC, TILS, CD4, CD8, Survival, Egypt.*

Introduction

In developed countries, ovarian cancer (OC) is the fifth most common cancer-related death(1).High grade serous ovarian cancer (HGSOC)constituted the majority amongovarian cancer subtypesand the deadliest. OCis usually diagnosed at late stage due to the few and unspecific early symptoms(2). The outcome of the patients who diagnosed with late stage disease is poor, where they usually develop treatment resistance(3). Hence, new effective therapeutic strategies are needed to overcome drug resistance and to improve long-term prognosis.

In the last few years, scientists provided evidences that immunotherapy is a promising treatment approach in OC(4-6). The programmed death 1 (PD-1)/PD-L1 pathway has an important role in the immune system downregulation. PD-1 is a cell surface receptor expressed by the activated CD4 and CD8 T cells and other immune cells. PD-L1, a ligand for PD-1, is expressed by tumor cells, tumor-associated macrophages, dendritic cells, T and B cells(7). Interruption of the PD-1/PD-L1 interaction using specific antibodies to either molecule can reactivate T cell function to work against tumor cells(8).

The expression of PD-L1, together with the abundant CD8+ tumor infiltrating lymphocytes (TILs) in the pretreatment tumor microenvironment proved to be a predictor to PD-1/PD-L1 blockingtherapy response in different tumors,including non-small cell lung cancer (NSCLC) and melanoma. In ovarian cancer, clinical data show moderate efficacy of anti PD-1/PD-L1 therapies with some durable responses(9).

Patients and Method

This is a retrospective study included 94 primary HGSOC specimens of Egyptian patients diagnosed between 2011 and 2017. Cases were collected from National Cancer Institute (NCI), Cairo University. Follow up time was up to 84 months with a median period of 24 months. High histologic grade was confirmed based on the criteria of the World Health Organization classification system[11]. The clinic-pathologic characteristics are detailed in Table 1.

Immunohistochemistry: Sections at a thickness of 4 μm were obtained from the paraffin-embedded tissues and placed onto X-tra adhesive slides. Standard immunostaining was done using BenchMark XT (Ventana) autostainer according to the protocol instruction. Ready-to-use primary monoclonal antibodies were used under specific incubation temperature and time as follows: Rabbit monoclonal antibodies against PD-L1 (MD21R), Cat No (RM0324RTU7), anti-P53 (DO-1), Cat noMA5-12571 (Thermo Fisher), rabbit monoclonal antibodies (Roche) for both CD4(SP35), cat no790-4423 and CD8 (SP57), Cat no790-4460. Tissue sections from normal tonsil was included on each slide as a positive control.

PD-L1 and P53 immunohistochemical analysis: Tumor cells with a membranous (complete circumferential or partial) staining and/or cytoplasmic staining in ≥ 5% of tumor cells were considered to be positive[7]. According to the type of mutation, missense or nonsense mutations, antibody against P53 will show two patterns of staining [10].High grade serous carcinoma was confirmed when either a diffuse or strong p53 staining in 75–100% of tumor cell nuclei (diffuse pattern), or a completely negative reaction (null pattern), are detected.

Quantitative analysis of CD4 + and CD8 + TILs: Both CD4 and CD8 were assessed in tumor microenvironment and counted at high-power fields (HPF) (40x magnification). T lymphocytes infiltrating into cancer cell nests, designated as intraepithelial T lymphocytes, while T-cells present in the perivascular spaces and/or tumor-associated stroma, designated as stromal T lymphocytes. Five fields with the highest positive cells density (hotspots) were selected, and the average count was calculated. According *Wang and colleagues study* scoring protocol; CD4 and CD8 protein expression less than/equal to 5 designated as score 1, 6-20 (score 2), and > 20(score 3)[7].

Statistical Method

Data was analyzed using IBM SPSS advanced statistics (Statistical Package for Social Sciences), version 24*(SPSS Inc., Chicago, IL)*. The association between categorical variables was determined by the standard chi-squared (Fisher's exact) test. Multivariate analysis was done for variables statistically significant on univariate level to indicate independent prognostic factors and to obviate the effect of confounders using logistic regression model. The hazard ratio (HR) and its 95% confidence interval were determined via a Cox regression model and survival curves were plotted from Kaplan–Meier estimates.DFS and OS were used for survival endpoints. A p-value less than or equal to 0.05 was considered statistically significant.

Results

Expression pattern of P53 in all selected HGSOC cases: P53 expression pattern showed a strong diffuse pattern in 59/94 cases (63%) (figure 2), while in rest of cases, it showed a complete absent expression (null pattern). Both patterns of expression together with the morphologic features confirmed tumor high grade.

Negative expression of PD-L1 in tumor cells is associated significantly with better OS: Using a 5% threshold[7], positive PD-L1 expression was observed in both tumor cells and TILs. It showed patchy pattern of distribution as membranous/cytoplasmic staining in majority of cases. The positive tumor PD-L1 immuno-reactivity was detected in 23 (24%) patients (figure 2). The expression of PD-L1 in TILs, mainly in stromal TILs, was detected in 26 cases (27.6%).

Kaplan-Meier curve analysis was performed to investigate the effect of PD-L1 expression of tumor cells on survival. Univariate analysis revealed a significant correlation between longer overall survival (OS) and negative PD-L1 expression in tumor cells (p=0.025) (Figure 1). On multivariate analysis (Cox regression model), negative PD-L1 expression in tumor cells proved to be an independent prognostic factor affecting overall survival (p= 0.010).

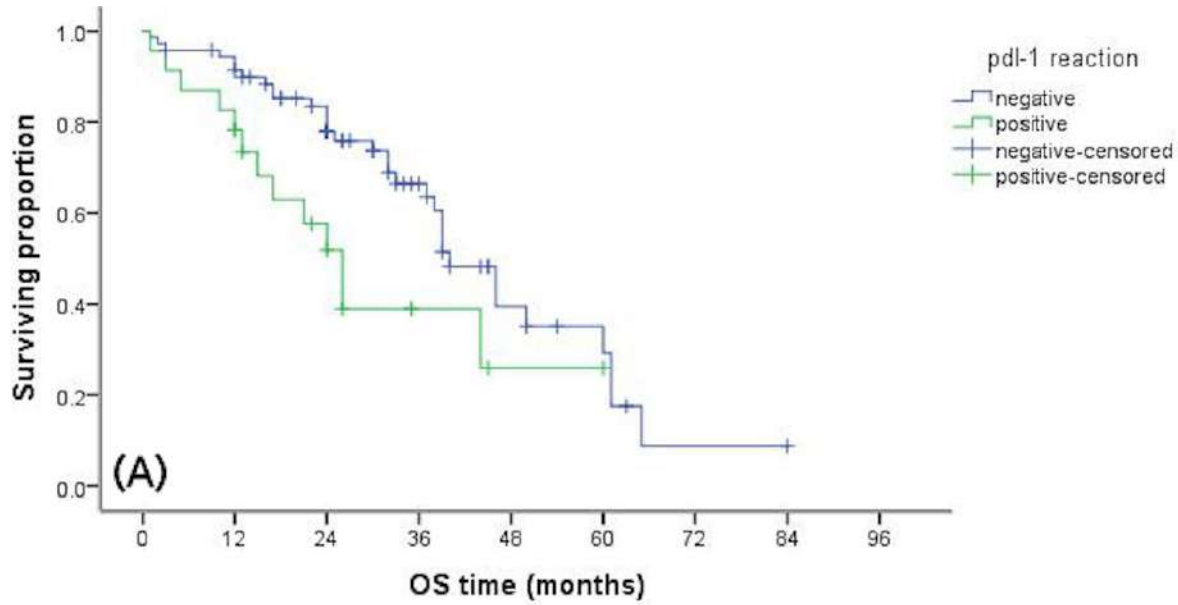
A combined high CD8 expression with negative PD-L1 affects the OS significantly: Both CD4 and CD8 were expressed in TILs, within cancer stroma and intraepithelial tumor cells. Most TILs were peritumoral rather than intra-tumoral and the numbers of intra-stromal TILs were higher than intraepithelial

TILs in majority of cases. Representative examples of immunohistochemical patterns and scores of CD4 and CD8 are illustrated in figure 3.

A significant correlation was found between PD-L1 expression in tumor cells with intraepithelial CD8+ TILs (p= 0.003): In a Univariate analysis, cases that showed both negative expression of PD-L1 in tumor cells and higher density of intraepithelial CD8+ TILs (score 2 & 3), lived significantly longer than all other groups (p= 0.021). On the other hand, a Univariant analysis revealed that higher numbers (score 3) of stromal CD8+ TILS alone, had a significant correlation with better DFS (p= 0.007). Moreover, high CD8+ stromal TILs proved to be an independent prognostic factor for DFS (p= 0.021).

Table 1: The clinicopathologic characteristics of the studied patients (n=94).

Clinicopathological Variable		Frequency	Percentage
Age (Years)	≤55	44	47%
	>55	50	53%
Tumor histology	- Papillary serous adenocarcinoma	93	99%
	- Mixed papillary serous adenocarcinoma and transitional cell carcinoma	1	1%
FIGO Stage	I	19	20%
	II	7	7%
	III	63	68%
	IV	5	5%
Debulking data	Presence of residual disease	39	41.5%
	No residual disease	51	54.35
	No available data	4	4.2%
Response to first line chemotherapy	Platinum-Sensitive	39	42%
	Platinum-Resistant	50	53%
	No available data	5	5%
CA125 level	High	91	97%
	Normal	3	3%



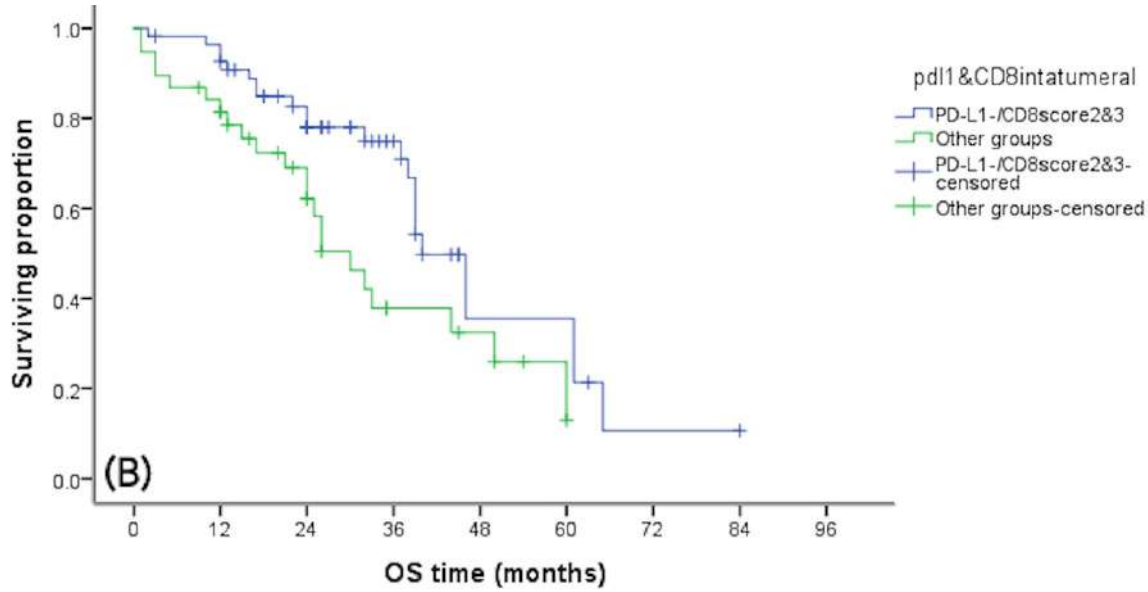


Figure 1: Kaplan-Meier survival analysis for HGSOC cases expressing negative/positive PD-L1 protein. (A) Negative PD-L1 expression correlates with better OS in HGSOC patients (p= 0.025). (B) Patients with negative PD-L1 expression in tumor cells associated with higher numbers of intraepithelial CD8+ TILs (score 2 & 3), lived significantly longer than other patients (p= 0.021).

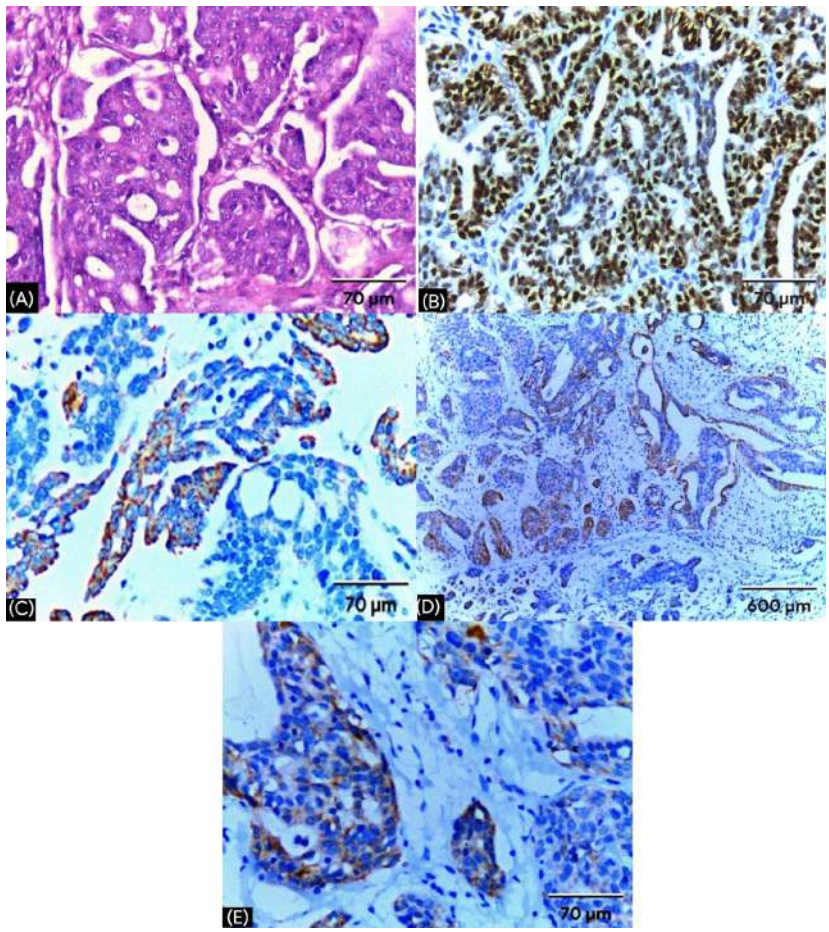


Figure 2: (A) A representative example of HGSOC case (H & E, x40)(B) P53 expression in HGSOC showed strong nuclear reaction in the majority of tumor cells (x40). (C, D & E) Representative cases of positive membranous expression of PD-L1 in the tumor cells (x40, x10 & x40).

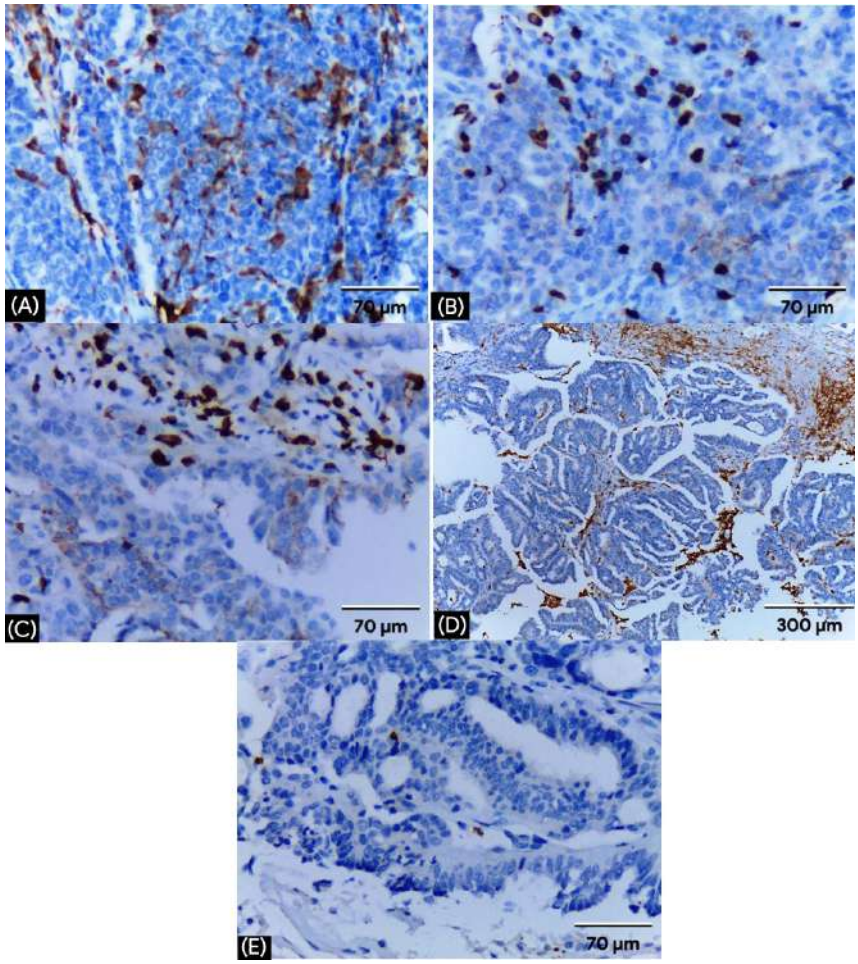


Figure 3: Immunohistochemical staining to demonstrate the expression pattern and different scoring of CD4+ and CD8+ TILs. (A) Intraepithelial CD4+ TILs (score3) (x40). (B) Intraepithelial distribution of CD8+ TILs (score2) (x40). (C) Stromal CD8+ TILs (score3) (x40). (D) A representative example of stromal CD8+ TILs (Score3) (x20). (E) Intraepithelial CD8+ (score1) (x40)

Discussion

In the last few years, immunotherapy has become the most attractive strategy of cancer treatment, due to its therapeutic efficacy in improving tumor prognosis and clinical outcome. Malignant tumors evade the immune system through PD-1/PD-L1 inhibition pathways[12]. Disruption of this axis using specific blocking monoclonal antibodies can induce durable remissions in different cancer types including melanoma, lung cancer and urothelial carcinoma[13].

Here, we aimed to investigate the expression level of PD-L1 together with CD4 and CD8 +TILs density, and their relation to outcome in HGSOC Egyptian patients. To the best of our knowledge, no such study has been yet reported in HGSOC Egyptian patients.

We used 5% as a cut-off for PD-L1 expression by IHC, as it has been proved to be a predictive for many immunotherapeutic drugs as Nivolumab and Pembrolizumab. The 5% threshold value was also used in most of previous studies for other types of tumors[7,14].

Based on our finding; 23/94 (24%) patients had patchy positive tumor PD-L1 (cytoplasmic/membranous) staining pattern. PD-L1 expression was also detected in stromal TILs (26 cases, 27.6%). PD-L1 expression rate and pattern in our study were in concordance with that found in Wang and colleagues' study[7]. They used the same cut-off value of 5%, and they also found similar PD-L1 positive rate (24.30% of their studied cases).

Some other studies reported different expression rate and localization. In one study, no cases exceeded 10% of staining in tumor cells[15]. In other reports, PD-

L1 primarily expressed in TILs and macrophages rather than tumor cells[8,26]. The explanation for that isthe use of different PD-L1 antibodies with different staining protocol, also the use of different cut-off value for PD-L1 positivity.

Consistent with other previous reports[7,16,18], our study revealed that lack of PD-L1 expression in tumor cells correlates better with OSInboth univariate and multivariate analysis. Other reports stated that positive PD-L1+ tumors are associated with increased overall survival and progression- free survival[19]. These studies performed immunostaining for PD-L1 using different anti-PD-L1 clones. In other studies, where expression of PD-L1 was interpreted in TILs and tissue associated macrophages, its expression was also associated with better survival[8,17] . In a recent meta-analysis study done by Huang and colleagues, they indicated that PD-L1 expression may be a negative predictor for prognosis of OC patients from Asian countries, while it is a good predictor for favorable prognosis of OC patients from non-Asian countries[20].

PD-L1 expression should be best interpreted in the context of intra-tumoral T cell infiltration for therapeutic purposes[21].We found that positive tumor PD-L1 expression was more commonly observed in patients with high intraepithelial CD8+TILs density (p=0.003). This finding is consistent with the result of Wang and colleagues' study[7]. They suggested that the expression of PD-L1 in HGSOC is due to the adaptive immune resistance. In this mechanism, IFN-γ expression by TILs leads to local PD-L1 expression by the tumor cells, which allows it to "escape" immune surveillance[22]. Teng and colleagues have proposed 4 different patterns of tumor: Type I tumors with adaptive immune resistance (PD-L1 positive/TILs present), type II with immune ignorance (PD-L1 negative/TILs absent),type III with intrinsic induction (PD-L1 positive/TILs absent) and type IV immune tolerance (PD-L1 negative/TILs present)[23].

In the present study, cases which showed PD-L1-ve/intraepithelial CD8+ TILs (score 2 & 3), lived significantly longer than other patients. This support the importance of studying both PD-L1 and CD8+TILs together for the purpose of survival and immunotherapy prediction.

The localization of TILs seems to be of major relevance to their prognostic impact[7]. In our study we found on a univariate analysis that higher numbers of stromal CD8+ TILS (score3) was significantly associated with longer DFS, which remained a significant factor in multivariate survival analysis. This was further supported by other studies[24,25]. They found that the presence of intraepithelial $CD3^+$ or $CD8^+$ T-cells is correlated with improved disease outcome.

In conclusion, results of our study indicated that lack of PD-L1 expression in HGSOC Egyptian patients is associated with better overall survival. Higher number of stromal CD8+ TILS is significantly associated with longer DFS. The combined negative PD-L1/higher score intraepithelial CD8+TILs, can predict better OS and can be used in stratifying HGSOC patients for PD-1/PD-L1 blockade therapy.

Conflicts of Interest: None.

Ethical Clearance: Taken fromEthical Institutional Review Board of NCI, CU.

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Association between Jordanian Ostomates' Knowledge about Intestinal Ostomy Care and their Ostomy Health-Related Problems

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Abstract

Introduction: Patients with intestinal ostomy (IO) have several health-related problems and complications. This research is conducted to determine the correlation between the subjects' knowledge about IO care and the frequency of health-related problems and complications.

Method: A cross-sectional design and convenience sampling method were used to investigate 174 patients with IO (ostomates).

Results: Almost all of the subjects had at least one IO health-related problem. About half of the subjects had more than three IO health-related problems. The subjects' had low (poor) knowledge about IO care and management (mean±SD = 52.2±16.4, out of 100). The results showed negative correlation between ostomates' knowledge about IO care and their frequency of IO health-related problems and complications (r = -0.54, p = 0.03).

Conclusion: Continuing health eduaction and training programs are recommended to all patients with IO to imorove their knowledge about IO care and to prevent the negative health events and complications which are related to IO.

Keywords: *Intestinal ostomy, ostomates' knowledge, ostomy health-related problems.*

Introduction

Colorectal cancer is considered the third most common type of cancer[1,2] . Worldwide, the surgical intervention rate for insertion of intestinal ostomy (IO) is also increasing about 3% every year [2-4]. Previous studies have showed negative impact of IO on ostomates' quality of life (QOL). Also, most of the ostomates may have several ostomy-health related problems [4].

Previous studies have showed negative relationship between patients' knowledge and their skills to care and manage their IO, and ostomy health-related problems. Also, the patients with IO who had high knowledge about caring for IO, they are more capable of managing their IO and prevent further health-related problems and complications[4]. Therefore, all patients are required to obtain health teaching and training about IO care and management and provide them pre-discharge instructions to prevent the negative health events and complications that related to IO [5,6]. Healthcare providers, specifically nurse educators, have a major role in providing health

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teaching about caring of IO and managing of IO health-related problems [7].

Up to researcher knowledge, there is no published literature that investigate the Jordanian ostomates' knowledge about caring for their IO. Therefore, this current study was conducted to investigate the Jordanian ostomates' health-related problems and their knowledge about management of their IO. This important clinical research topic will be a baseline information for further research and for developing clinical guidelines for caring of IO and prevent its complications.

Study Objectives: This current study is aimed to identify: 1) the subjects' health-related problems of their IOs; 2) the subjects' exposure to health education and training about IOs caring 3) the subjects' knowledge about the characteristics and caring for IOs; and 4) the correlation between the subjects' knowledge about caring for their IOs and the frequency of having ostomy health-related problems.

Research Method

Research Design: This cross-sectional study was conducted to address the objectives of this study.

Research Sample and Setting: A convenience sampling method was utilized to recruit the 174 patients with IOs. All the subjects in this study were recruited from two private hospitals in Amman city, Jordan. The subjects of the current study were adult patients with IOs for at least one year, admitted to the selected hospitals for medical care or follow up appointment, and Arabic language speaker.

Data Collection Procedure and Ethical Considerations: Before conducting this study, official approval was obtained from the ethical committee for health research at Al-Ghad International Colleges for Applied Medical Sciences. A written consent form was signed by all the eligible subjects who decided to participate in this research. The subjects were noted that their participation in the current research is voluntary and their personal information will be confidential and anonymous. The participants took between 10 to 15 minutes to complete filling the adopted questionnaire.

Instruments: A structured self-report questionnaire was used to address this study's objectives. The subjects' medical record was checked to identify their clinical data (e.g. types of stoma). The subjects' were asked to report their IO health-related problems and the complications by answering either "yes" if they have any of the listed IO health-related problems or "no" if they have not. These IO health-related problems include 13 health problems such as abdominal gases, abdominal pain, and odor from the IO. This tool was adopted from City of Hope QOL–ostomy questionnaire (specifically physical well-being subscale), which is published in a previous study that investigated the QOL among the patients with abdominal ostomies [8]. The validity and reliability of this subscale is documented and used in several previous international studies.

The participants were asked to report any exposure to previous health education or/and training about caring for IO in a prior year of data collection. Also, they were asked to report their intention to have continuing health education or/and training program in the future about IO care and management of IO health-related problems and complications. This tool was adopted and modified based on the previous studies [9,10].

A Stoma-related Knowledge Scale was adopted from a previous Chinese study[11]. This tool is used to identify the perception of the subjects' knowledge about their IO care and management of its complications. The original tool was consisted of 14 items [11]. Six items, which are related to the characteristics of IO and management of IO health problems and complication, were added to this tool. The subjects' responses on this 5 points likert scale [11] were ranged between (1=not at all know) and (5=totally know). The highest total score of this scale (100) indicates the highest knowledge about caring of IO and management of its complications. Based on the previous Chinese study, the subjects' total score between 81 and 100 indicate a high (excellent) level of knowledge, subjects' score between 61 and 80 indicate middle (good) level of knowledge, subjects' score between 41 and 60 indicate low (poor) level of knowledge, and scores below 40 indicate very low (very poor) level of knowledge about IO care.

Data Analysis: SPSS software program was used for statistical analysis. Frequencies and descriptive statistics were used to identify the proportions and the averages of the collected data. Pearson's correlation test was also carried out to determine the correlation between the subjects' knowledge about caring for their IOs and the frequency of having ostomy health-related problems. The significant p value was preset as < 0.05.

Results

Approximately, three fourth of the subjects had permanent IO (73%). The majority of the subjects had colostomy (67.2%). Approximately, 32.8% of the subjects had iliostomy. Reviewing the subjects' record showed a diagnosis of cancer in colon or rectum was the major (54.6%) reason for insertion of IO. Almost all of the subjects (97.1%) had ostomy-related health problem. High frequency of the subjects (48.3%) had four or more ostomy-related health problems. The mean of the subjects' ostomy health-related problems, prior two weeks of hospitalization, was 8.83 (out of 13 health problems) (Table 1).

Table 1. Participants' Clinical Data and Ostomy Health-Related Problems

Variables	n	%
Types of stoma		
Permanent intestinal ostomy	127	73.0%
Temporary intestinal ostomy	47	27.0%
Location of ostomy		
Colostomy	117	67.2%
Ileostomy	57	32.8%
Reasons of ostomy insertion		
Cancer colon or rectum	95	54.6%
Intestinal obstruction	22	12.6%
Inflammatory bowel disease	30	17.2%
Others*	27	15.5%
Number of ostomy-related health problems during the last two weeks of hospitalization	n	%
No ostomy-related health problem	5	2.9%
One ostomy-related health problem	12	6.9%
2-3 ostomy-related health problems	73	42.0%
≥ four ostomy-related health problems	84	48.3%
Total score of the participants' ostomy-related health problems (ranges from 0 to 13 ostomy-related health problems)	**Mean** 8.83	**(±SD **)** ± 2.41

* Trauma, infectious enteritis, colonic polyp,.. etc., ** SD: Standard deviation

The findings showed that about 59% of the subjects had exposure to previous health education and training about IO care prior one year. Among them, about 63% of the subjects received their health education or training about IO care by nurses. Whereas about 37% of the participants received the heath education and training by physicians. The majority of the subjects (82.2%) were intended to participate in continuing health education about IO care in the future (Table 2).

Table 2. Participants' Exposure to Health Education and Training Program about Ostomy Care

Variables	n	%
Exposure to previous education or training about ostomy care during the last 12 months		
Yes	102	58.6%
No	72	41.4%
Sources of previous education or training about ostomy care during the last 12 months (n = 102)		
Nurses	64	62.7%
Physicians	38	37.3%
Willing to participate in continuing health education and training program about ostomy care in the future		
Yes	143	82.2%
No	31	17.8%

The subjects believed that they were more knowledgeable about the definition of the stoma (Mean±SD= 3.8 ±1.2), the purpose of the stoma (Mean±SD= 3.6±0.9), and the amount of daily fluid intake (Mean±SD= 3.5 ±9) than other items regarding IO care and management (Table 3).

Table 3. Perception of the subjects' knowledge about their intestinal ostomy care and management

Variables		Mean (±SD)
How do you rate your knowledge about the following items: (Mean out of 5)		
1.	Anatomy and physiology of the gastrointestinal tract	2.2 (±0.6)
2.	Definition of the stoma	3.8 (±1.2)
3.	Indication and purpose of the stoma	3.6 (±0.9)
4.	Components of a pouching system and stoma care products	2.6 (±0.7)
5.	Amount of daily fluid intake	3.5 (±0.9)
6.	Proper foods to eat with a colostomy	2.8 (±0.8)
7.	How to control gases	2.6 (±0.6)
8.	How to control odor	2.7 (±0.8)
9.	Bathing and personal hygiene	3.1 (±0.9)
10.	Normal appearance of stoma and peristoma skin	2.8 (±0.8)
11.	How often to change colostomy pouch	2.4 (±0.6)
12.	Monitoring and managing of potential stoma complications	2.1 (±0.4)
13.	Clothing style change	3.0 (±1.3)
14.	Daily life change	3.1 (±1.2)
15.	When should contact, follow up, and visit healthcare provider as instructed	3.4 (±1.5)
16.	How to measure stoma	2.4 (±0.7)
17.	Changing the stoma appliance	2.5 (±0.8)

Variables		Mean (±SD)
18.	Ostomy irrigation	1.9 (±0.3)
19.	Applying the clean pouch	2.7 (±0.6)
20.	Peristomal skin care	2.3 (±0.9)
Mean for the total score of the subjects' perception about IO characteristics and management (Mean out of 100)		52.2 (±16.4)
Overall mean of the subjects' perception about IO characteristics and management (Mean out of 5)		2.64 (±0.8)

The results of the correlation analysis also showed there is significant negative correlation between the perceived subjects' knowledge about IO care and their IOs health-related problems (r = -0.54, p=0.03).

Discussion

Unfortunately, almost all (97.1%) of the subjects reported that they have at least one IO health-related problem. Among them, slightly less than half (48.3%) of the subjects have more than three IO health-related problems. The subjects of this current research reported that odor and gases from IO and abdominal discomfort and pain are the most IO health-related problems that they were complaining prior two weeks. These findings regarding to IO health-related problems were reported in many studies[12-14]. The previous literature also showed that patients with IO had several ostomy health-related problems and complications. Moreover, the literature documented that these health problems have negative effect on ostomates' QOL, including social, psychological, physical and spiritual health status[6].

The results of this study and previous studied showed that the patients with IO had lack of exposure to previous health education and training about IO care and management of ostomy health-related problems and complication[5,9,15]. While the majority of the ostomates in this study and the previous study reported that they are intended to participate in health education and training programs about IO care and management in the future[9]. So, the ostomy nurse specialists and/or nurse educators should provide continuing health education programs for ostomates to improve their knowledge and skills to care of IO and prevent further health problems and complications.

The result of this study showed that the mean for the total score of the subjects' perception about IO characteristics and management is low (52.2±16.4) (mean out of 100).

In the previous Chinese study, the mean of the subjects' level of knowledge about IO care is good (45.1±13.3) (mean out of 60)[11]. These results indicate that the subjects of this study have lower level of knowledge about IO care and management than the patients with ostomies in the previous Chinese study [11].

The results of this study and the previous Chinese study[11] showed that there is significant correlation between ostomates' low level about IO care and high frequency of having IO health-related problems and complications. Moreover, many previous studies revealed negative association between the ostomates' level of knowledge about IO care and the level of QOL[5,6,16]. Therefore, improving the ostomates' knowledge and skills about IO care and management of its complications is very important. Distributing written materials such as handout, and utilizing multimedia and online resources about ostomy care is recommended for all the ostomates before they are discharged from the hospitals or when they visit the physicians clinics or other health care settings[5,17].

Study Limitations: Conducting cross-sectional design is limited to determine cause and effect relationship and it dose not help in studying the subjects' perception and health-related problems over a period to time. Also, using convenience sampling method may lead to limit the generalization of the findings to Jordanian people in different regions.

Conclusion

Patients with IOs have several health-related problems. The findings of this and previous literature revealed that there is significant negative association between lack of ostomates' awareness and knowledge about IO care and proportion of IO health-related problems and complications. Patients with IO should be provided with teaching and training about IO care management.

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Comparison between Lord Dilitation Versus Lateral Internal Sphincterotomy for Management Post Hemorrhoidectomy Pain and Stenosis

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Abstract

Hemorrhoidectomy is usually associated with significant pain during the postoperative period. The spasm of internal sphincter seen to play an important role in the origin of pain. This study was designed to evaluate the effectiveness of lateral internal sphincterotomy or Lord dilatation of anal sphincter after hemorrhoidectomy in regarding the maximum resting pressure of the anal canal, accelerating wound healing and decrease postoperative pain when resting and defication. The patients with profound or diagnosed hemorrhoid (n = 79), visited to the Alfayha teaching hospital during April 2016 to June 2017 were enrolled in the present study. The informed consent was taken from each patient before enrollment. Seventy nine patients were admitted in the hospital complaining from anal stenosis and pain after different method of hemorrhoidectomy. The patients underwent hemorrhoidectomy with unhealed wound and severe pain after defication one month ago. They were divided into the two groups *viz.* patients treated with lateral internal sphincterotomy (n = 40) or lord dilatation surgery (n = 39). In the present study the ratio of lateral internal sphincteroctomy to lords dilatation surgery were found to be 2.761. The occurrence of the hemorrhoid was found to be higher in male than females (2.95:1). The higher number of patients were from 21-30 age group. About 69.2% of male patients ere operated by lord dilatation, while 33 (82.5%) of male patients managed by lateral internal sphinctertomy. Around 12 females (30.8%) managed by lord dilatation and 7 (17.5%) female patients managed by lateral internal sphincterotomy. Out of total patients, 43 were suffering from diabetes mellitus where, 16 were operated by the lard dilation and 27 were operated with lateral internal sphincterotomy. Around 22 suffering steroid problem out of which 17 were operated by the lard dilation and 5 were operated with lateral internal sphincterotomy. About 3 patients were suffering malignancy (2 in lard dilation and 27 in lateral internal sphincterotomy surgery). The present study concluded that the lord dilatation is significant improve wound healing after hemorrhoidectomy and decrease pain.

Keywords: *Hemorrhoids, Lord dilatation, Lateral internal sphincterotomy, Stenosis.*

Introduction

Hemorrhoids are the dilated or enlargement of veins in the walls around the rectum and anus due to prolong and untreated constipation[1]. However, it sometimes linked to chronic diarrhea and also known as “piles”. Sever blooding is the first symptoms of it. If untreated, then it can become worsened, protruding from the anus. Around 50% of the peoples are having hemorrhoids by the 50 years age. It is roughly calculated that about 58% people over 40 year age are having the disease in USA and almost one third patient goes to surgeons for the treatment[2]. At any age the hemorrhoids can occur, and

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affects both women and men. In developing countries, the exact incidence is unknown, but the hemorrhoids are more frequently being encountered. Hemorrhoids are thought to work as continence mechanisms part and aids in anal canals complete closure at rest[3]. Proposed etiological factors of hemorrhoidectomy includes absent valves in the portal vein, weak blood vessels, internal anal sphincters derangement hereditary, ageing, obesity, pregnancy, prolonged straining and constipation. In spite of various studies, the hemorrhoids pathogenesis remains still unclear[4].

Perhaps, for the treatment of hemorrhoids prevention is the best. Treatment involves changing the diet to prevent constipation and avoid further irritation, the use of topical medication, and sometimes surgery. Once the disease is established, over the time it tends to get worse[4]. For hemorrhoids the mainstay treatment is therefore surgical, but unluckily operative hemorrhoidectomy is generally connected with important postoperative complications involving anal stricture, bleeding and pain, which may result in a convalescence protracted period[5]. The Hemorrhoidal treatments recent meta-analysis has concluded that initial mode of therapy was rubber band ligation for the hemorrhoids of first to third-degree[2].

Anal dilatation is done as described by the Watt's et al[6]. The proctoscopy and 1st digital rectal examination is carried out to rule out other bleeding causes and to confirm clinical findings. After that right hand completely lubricated index finger is inserted and a band of constriction was palpated corresponding to anorectal line. After the constriction bands complete palpation, each hand completely lubricated index finger was introduced into the anal canal. A process continued till anal canal was enough relaxed to accept four fingers without much force.

Manual dilatations lord's procedure of the anus is mostly used over last 10 years, and at 5 years follow-up two small series have reported very good results[7]. The factors determining satisfactory outcomes are not defined. Early studies have indicated that patients having hemorrhoids area having higher anal pressure than controls and there the lords procedure have significantly reduced the pressure[8]. Hemorrhoidectomy is usually associated with significant pain during the postoperative period. The spasm of internal sphincter seen to play an important role in the origin of pain. This study was designed to evaluate the effectiveness of of lord dilitation versus the lateral internal sphincterotomy as a treatment of post hemorrhoidectomy pain and stenosis.

Material and Method

Patient Enrollment: The patients with profound or a diagnosed hemorrhoid (n = 79), visited to the Al Fayhaa teaching hospital during April 2016 to June 2017 were enrolled in the present study. The informed consent was taken from each patient before enrollment. The patients underwent hemorrhoidectomy with unhealed wound and severe pain after defication one month ago. They were divided into the two groups *viz.* patients treated with lateral internal sphincterotomy (n=40) or lord dilatation surgery (n=39).

Surgical Procedure: All patients were prepared for elective surgery. All surgery done under general anasthesia and lethiotomy position. In a lord dilitation surgery group, four fingers dilated anus was done while in the lateral internal sphincterotomy group, small incision was made at 3 o'clock, delivery of internal sphincter to the wound and cutting using electrocutery, skin closed with 3/0 vicryl.

All patients remain in hospital for 24 hours for postoperative observations. They were given antibiotic and NSAID as a medication. All patients were followed for six months for complications, if any.

Statistical Analysis: Results were presented as Mean ± standard deviation (SD). Dunnett multiple comparison test and one way analysis of variance (ANOVA) was done to estimate the statistical significance.

Results

Present study involved total 79 patients, out of which 39 were operated by lard dilatation and 40 were operated by lateral internal sphincterotomy. Here, higher number of patients were from 21-30 age group.

Table 1: Age groups of patients involved in the present study

Patient Age	Lard Dilatation	Lateral Internal Sphincterotomy	Total
11-20	07	03	10
21-30	20	22	42
31-40	07	05	12
41-50	04	07	11
51-60	01	03	04
60<	00	00	0
Total	39	40	79

Table 2 shows the number and percentage of male and female. About 69.2% of male patients ere operated by lord dilatation, while 33 (82.5%) of male patients managed by lateral internal sphinctertomy. Around 12 females (30.8%) managed by lord dilatation and 7 (17.5%) female patients managed by lateral internal sphincterotomy.

Table 2: gender vise distribution of enrolled patients

Gender	Lord Dilation	Lateral Internal Sphincterotomy
Male	27 (69.2%)	33 (82.5%)
Female	12 (30.8%)	07 (17.5%)
Total	39 (100%)	40 (100%)

All patients were arranged in Table 3 according to cause of post hemorrhoidectomy pain and stenosis in form of chronic illness (diabetes mellitus, steroid and malignancy). Out of total patients, 43 were suffering from diabetes mellitus where, 16 were operated by the lard dilation and 27 were operated with lateral internal sphincterotomy. Around 22 suffering steroid problem out of which 17 were operated by the lard dilation and 5 were operated with lateral internal sphincterotomy. About 3 patients were suffering malignancy (2 in lard dilation and 27 in lateral internal sphincterotomy surgery).

Table 3: Type of delayed wound healing

	Lard dilation	Lateral internal sphincterotomy	P value
Diabetes mellitus	16	27**	0.01
Steroid	17	5***	0.001
Malignancy	2	1	--
No chronic illness	4	7*	0.05
	39	40	

The results are presented as Mean ± standard deviation (SD). ***p≤0.001, **p≤0.01 and *p≤0.05 when compared between lord dilatation and lateral internal sphincterotomy (Dunnett multiple comparison test).

After three days of the procedure, patients showed decrease in pain, improvement of wound healing in the lord dilitation surgery group as compared to the patients with lateral internal sphincterotomy. Five patients developed fistula in ano, one has anal fissure, and three patients remain with unimproved wound. On the other hand, patients operate with lord dilitation showed noticeable improvement in the above parameter except one patient.

Various types of complications are observed in lateral internal sphincterotomy and lord dilatation. Fistula in ano observed in 5 patients, all were treated by lateral internal sphincterotomy, recurrent anal fissure was observed in 1 patient, which was treated by lateral internal sphincterotomy, delayed wound healing was observed in 4 patients out of which 3 were treated by lateral internal sphincterotomy and 1 by lord dilatation.

Table 4: Complications in various types of procedures

Type of procedure	Fistula in ano	Recurrent anal fissure	Delayed wound
Lateral internal sphincterotomy	5***	1**	3*
Lord dilitation	0	0	1

The results are presented as Mean ± standard deviation (SD). ***p≤0.001, **p≤0.01 and *p≤0.05 when compared between lord dilatation and lateral internal sphincterotomy (Dunnett multiple comparison test).

Discussion

Anal dilitation is related to the uncontrolled damage of internal sphincter fibers which extent to the external sphincter[6,9,10] and it's a most common couse of extensive anal pain[11]. Due to internal sphincter hypertonia, chronic anal pain and stenosis was occurred which forms the surgical treatment basis[9] which can be either lord dilatation or lateral internal sphincterotomy. The resting anal pressure is reduced by lord dilatation and lateral internal sphincterotomy[6]. In the present study, we compared both the method. The ample amount of research is published regarding both the techniques. They are effective heal the ulcer and quickly reduce pain. Previous studies reported that about 95% anal dilatation treated patients showed satisfactory relief[12]. While, about 93% patients showed fairly less pain relief in 1 week after lateral internal sphincterotomy surgery (Hoffmann). The present study, both the groups showed rapid improvement in symptoms and ulcer healing in both groups. However, lord dilatation was found to be effective in some aspect, such as recurrence anal fissure, wound delayed etc. than lateral internal sphincterotomy.

In the treatment of hemorrhoids two surgeries are widely performed involving lateral internal sphincteroctomy (LIS) and lords anal dilatation (LAD). LAD is a simple, ancient surgical technique, having high incontinence and recurrence rate[13]. Now a days, LIS is the favored surgical technique, nevertheless with incontinence high incidence. Hence, the aim of

present study is to compare LIS with LAD in the anal fissure treatment, recognizing recurrence, post-operative complications and symptoms. When compared the postoperative complications and symptoms and their recurrence among both, the LAD and LIS group, the LAD was found to be more significant than LIS. However, some studies reported the contradict reports[14,15].

In the present study, the ratio of lateral internal sphincteroctomy to lords dilatation surgery were found to be 2.761. The occurrence of the hemorrhoid was found to higher in male than females (2.95:1). The results are according to the earlier reports[11,16]. The male to female ratio were reported by several authors. Around 2.3:1, 1.7:1 and 1.4:1 of male to female ratio were reported by Nahas et al.[16], Kumar et al.[17] and Gupta et al.[11], respectively. In the hemorrhoid, blooding through the rectum and constipation are very common[18,19]. Lateral internal sphincterotomy surgery showed fistula in ano, recurrent anal fissure and delayed wound as compared to the lord dilatation. Kumar et al.[18] reported sentinel tag at 6 o'clock, while in the present study we have done at 3 o'clock. He reported no statistical difference ($p=0.565$) in the LAD and LIS. However, our study contradicts to this report. The study reveals significant ($p<0.001$) variation in the fistula in ano, recurrent anal fissure and delayed wound between LAD and LIS.

Diverse reports are available for the comparison between anal dilitation and lateral internal sphincterotomy[10]. Through the study is well planned, still there are some limitations. There are the enrolled patients are relatively low. Lateral internal sphincterotomy surgery showed consistency while dilitation technique showed variation regarding the number of employed. Lack of provisional anal manometer to moniter anal pressure is also one of the lacuny. Despite of these limitations, the present study demonstrate significant benefits of lateral internal sphincterotomy overlord anal dilatation.

Conclusion

The ratio of lateral internal sphincteroctomy (LIS) to lords dilatation surgery (LAD) was found to be 2.761. The occurrence of the hemorrhoid was found in higher in male than females (2.95:1). Significant ($p<0.001$) variation in the fistula in ano, recurrent anal fissure and delayed wound between LAD and LIS. The study can be concluded as, lord dilatation (LAD) is significant improve wound healing after hemorrhoidectomy and decrease pain.

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Competency-based Assessment of Public Health Professionals in the Northeastern Region, Thailand: An Exploratory Factors Analysis

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Abstract

Competency-based assessment of health professionals is important required for human resource for health development in Thailand. There are various efforts to improve a professional standard in public health professionals, but there is a lack of understanding of the competency of public health professionals, especially the competency-based assessment suitable for public health professionals. This study aimed to investigate the competency of public health professionals at the primary care service level in Northeastern, Thailand.

This research is a quantitative cross-sectional survey. Data collected by a questionnaire was conducted in 862 public health professionals in the northeast of Thailand. The exploratory factor analysis (EFA) method was applied to analyze the correlation effects of the 30 estimating competency-based assessment.

The results were revealed that their competency-based assessment as three aspects following: (1) Health care analysis and management (2) Public Health Professional Sciences (3) Basic Health Sciences. Additionally, The 3 groups of competency-based assessment were included 30 items suitable for the current sample. These factors accounted for 66.60% of the variance.

In conclusion,this finding is significantly recommendations to policy makers to improve and initiate a new policy or guidelines for public health education and human resource for health production and management in Thailand on the basis of their specific needs. Especially, the competency-based assessment from this research provide an excellent framework for developing a public health curriculum in the future in Thailand.

Keywords: *Public Health Education, Health Professional, Competency-based assessment, Primary health Care.*

Introduction

A Competency-based comprised as knowledgeable, skilled and motivated of health workforce is critical aspects for reaching universal health coverage. Health workforce includes that provide health services and those support the health services such as public health professionals. World Health Organization is supporting countries in achieving national and international golds to strengthen their health workforce and find sustainable solutions to health workforce issues as the education of health workers, planning and to produce information for policy makers to take evidence-based decisions. The recommendations of United Nation Commission on health employment and economic growth is emphasized on education, especially scale up trans formative, high quality education and lifelong learning so that all health workers have skill that the health needs of populations and can work to their full potential(1).

For over four decades now, competency models have become an inseparable part of human resources management and have been widely used as a means for increasing personal and organizational efficiency.

Competencies include the collection of success factors necessary for achieving important results in a specific job or work role in a particular organization. Competency refers to the intellectual, managerial, social and emotional competency[2]. In 1973, McClelland argued that the best predictors of outstanding on-the-job performance were underlying, enduring personal characteristics that he called competencies[3]. Klemp (1980)defined competency as, an underlying characteristic of a person which results in effective and/or superior performance on the job[4]. In 2006, Caupin Gilles et al., came out with their paper defined a competence is a collection of knowledge, personal attitudes, skills and relevant experience needed to be successful in a certain function[5]. In the recent years, many meanings and new labels have evolved through common usage for the term 'competence' and 'competency'.

Many health care organizations have proposed standards for competence in their fields, but the acceptance of a unique definition for all professionals is difficult. There is no agreed definition of professional competence in health care activities that encompasses all important areas of practice. There is a lack of consistency in the terminology regarding competence. The assessment of competence is nevertheless an important factor in developing an ambitious policy of continuous quality improvement in health care[6] The low- and middle-income countries seeking to achieve universal health coverage face human resource constraints. These countries encounter a human resource crisis in the health sector in the form of education and training capacities and it is difficult to narrow the gap between the demand for health workers ability to supply[7].

The public health professionals were significant for primary care services in Thailand,especially serviced for health promotion, health prevention, and disease control in the community. Currently, Thailand is developed regarding expertise and professionalism in the health workforce; especially develop in public health professionalism. This was announced by the Professional Act of Public Health in Thailandin 2013[8]. However, the Office of the Civil Service Commission is determined as to set and formulate specification qualification for work position[9]. Although there are efforts to create professional standards, these have not yet been outlined and not yet been officially announced. There is a lack of understanding of what the core competency of public health professional, should be.

The objective of this study is to investigate the competency-based assessment of public health professionals at the primary care service level in Northeastern, Thailand.

Material and Method

Sample and Procedure: This research is a quantitative cross-sectional survey. The quota sample survey was conducted the public health professionals in primary health care services from health promoting hospitals and used quota sampling to select 1,000 respondents (50 respondents/province) from 9,424 public health workers in 20 provinces of Northeastern Thailand. This survey had a response rate of 86.20 per cent (862 respondents). A public health professional is defined as a person who is responsible regarding overseeing aspects related to support health promotion, basic patient treatment, health policy, environmental health and occupational health in the community, work position as public health scholar in Thailand. Data were collected by a questionnaire survey during October-December 2017.

Ethical Consideration: The study was approved by the Mahasarakham University Ethics Committee for Research Involving Human Subjects, (053/2017). Written informed consent was attained from all study participants.

Instrument and Instrumentation: The questions developed from the literature review and synthetic review approach from previous topic from 6 sources. The comparison of competencies of public health professionals demonstrates the different standpoints concern in the competencies. The standpoints were classified into 2 groups: Group 1 educational institutions constitute 1) The Council on Linkages Between Academia and Public Health Practice (10) and Group 2 consisted of the following public health organizations comprising 1) World Health Organization Regional Office for the Western Pacific (11) 2) WHO Regional Office for Europe (12) 3) Centers for Disease Control and Prevention: CDC (13) 4) The Professional Act of Public Health in Thailand (8), and Ministry of Public Health, Thailand (14).

A framework for competency-based assessment of public health professionals were therefore constructed containing the following domains: Epidemiology and surveillance, Health promotion and control, Public health administration and health system, Disease diagnoses and

basic treatment, Biostatistics and public health research, Social determinant of health, and environmental health and occupational health and safety.

The questionnaire was tested for content validity by 5 experts, with a straightness of 0.845 and tested for reliability by using 30 tools,with the Cronbach alpha coefficient equal to 0.992.

The final version of the questionnaire was divided into two parts including:

Part 1 demographic data, including sex, age, marital status, education, work position, work experience, and workplace.

Part 2 competency-based assessment of public health professionals using the 30 items.

Data Analysis: Descriptive statistics were used to analyze demographic data. An exploratory factor analysis (EFA) using principal component method was performed on the inter correlations among the means of the competency-based assessment items. To extract the number of factors, I submitted the original 30 items. A Principal Component Factor analysis using Varimax rotation was completed to investigate the competency-based assessment of public health professional. Kaiser-Meyer-Olkin (KMO) was 0.976 and Bartlett' s Test of Sphericityis significant. Analyzing factor loading, that shows the variance explained by the variable on that particular factor. We determined the factor loading more than 0.3. following Field[15] recommend suppressing factor loadings less than 0.3.

Finding:

Demographic Characteristics: Among the 862 public health professionals, as public health practitioners 582 (67.50%) were females, and 280 (32.50%) were males. Ages ranged from 21 to 59 years with an average age of 37.72 years (SD=10.833). The majority of sample (62.10%) had abachelor degree in public health. The work experience more than 20 years was 31.19%, about a half was working at a health promoting hospitals as a primary health care service (55.00%).

Competency-based assessment of public health professionals

There have 30 items for competency-based assessment of public health professional. Data analysis used an exploratory factor analysis. Analyze the suitability by Kaiser-Meyer-Olkin (KMO) is 0.976 and Bartlett's Test of Sphericity is significant.

The analysis reveals three factors accounting for 66.60% of the variance. Factor first, which included 11 items,accounted for 24.62% of the variance. The second factor,which included 11 items, accounted for 24.07% of the variance. The third, which included 8 items, accounted for 17.91%. In addition, the eigenvalues for the factors were 57.92 (factor 1), 5.12 (factor 2), and 3.56 (factor 3) show in Table 1.

Table 2 shows each item's loading on the three extracted factors. Factor 1, namely "Health care analysis and management" were included 11 items. As noted in Table 2, items K11-14, K16, K18-23 loaded on factor 1. Factor loadings ranged with a high of 0.76 on item K19 ("Biostatistics") and factor loadings ranged with a low of 0.55 on item K16 ("Public health laws"). Each of these items refers to competency of public health professionals related to analytical science and management on public health area including statistical, information management, technology, policy, system, and laws.

Factor 2, namely "Public health professional sciences" were included 11 items. As noted in Table 2, items K1-15, K16 loaded on factor 2. Factor loadings ranged with a high of 0.82 on item K2 ("Health surveillance") and factor loadings ranged with a low of 0.51 on item K15 ("Professionalism and ethics in public health"). The items in this group presents specific competencies in the public health profession, including health promotion, epidemiology, disease prevention and control, health education, health monitoring, and professionalism and ethics in public health.

The last factor, namely "Basic health sciences" were included 8 items. As noted in Table 2, items K17, K24-30 loaded on factor 3. Factor loadings ranged with a high of 0.77 on item K29 (''Referral systems in health care'') and factor loadings ranged with a low of 0.48 on item K17 ("Basic treatment for patient"). The group of items indicates basic competency in health sciences, including health sociology, anthropology, social determinant of health, primary care management, occupational health and safety, and environmental health.

Discussion

The results present competency-based assessment to support that all area of public health education context

in Thailand. The first factor (Health care analysis and management) regarding issues of public health administration, policy, management, and laws. This studyis similar to Foldspang (16) and Ministry of Public Health of Thailand identify the role of public health professional in primary care cluster are managed a public health service delivery and supporting health service(14) and public health administration dimensions[17].

The second factor (Public health professional sciences), that reflects the professionalism and role of public health professionals in Thailand, whose primary role is health promotion, disease prevention, and disease control in the community both individuals, families, communities. Which corresponds to the scope of the health profession in the Professional Act of Public Health in Thailand in 2013, which specifies the role of support health education and consultation to health promotion, disease prevention, health control, basic treatment, and rehabilitation for patient[8] and similar to Health promotion, health protection and disease prevention in Foldspang[16].

The last factor (Basic health sciences) regarding basic competency in health sciences, including health sociology, anthropology, a social determinant of health, primary care management, occupational health and safety, and environmental health. As previous studies have similar findings as this research in aspect the list of public health generic core competencies for the public health professional identify in competencies of population health and its social and economic determinants[16].

Although in academic institutions in many countries, there is a widespread study of the performance of public health professionals, but in Thailand, in terms of the development of competencies of public health professionals, there are still limitations and the status is in the initial stage only. Next steps could include using these identified 3 knowledge competencies and 30 items as knowledge basis for public health professional to develop the policy option in producing and developing public health professionals, including an update of curriculum of public health programs in Thailand.

Table 1: Factors, Eigenvalue, Percentage of variances, Accumulative percentage of variances and Number of Items

Factors	Eigenvalues	Percentage of variances	Accumulative percentage of variances	Number of Items
1	57.92	24.62	24.62	11
2	5.12	24.07	48.69	11
3	3.56	17.91	66.60	8

Table 2 Items Loading on Three Factors

Item Loading on Five Factors		
Items	**Components**	**Items Loading**
Factor 1 Health care analysis and management		
K19	Biostatistics	0.76
K20	Health information management	0.75
K21	Health technology	0.75
K22	Health innovations	0.68
K18	Public health research	0.67
K12	Evaluation of health policy	0.66
K23	Evaluation of health status	0.64
K14	Health policy	0.64
K13	Health risk assessment	0.62
K11	Public health administration and health systems	0.61
K16	Public health laws	0.55

Item Loading on Five Factors		
Factor 2 Public Health Professional Sciences		
K2	Health surveillance	0.82
K4	Health investigation	0.81
K1	Epidemiology	0.79
K10	Disease prevention and control	0.68
K5	Public health Emergency response	0.68
K3	Health Diagnosis	0.67
K8	Health literacy	0.62
K6	Health promotion	0.58
K7	Health education and behavioral sciences	0.58
K9	Health monitoring	0.54
K15	Professionalism and ethics in public health	0.51
Factor 3 Basic Health Sciences		
K29	Referral systems in health care	0.77
K27	Health sociology and anthropology	0.73
K28	Health literacy	0.69
K26	Social determinant of health	0.66
K30	Primary health care management	0.64
K25	Occupational health and safety	0.57
K24	Environmental health	0.53
K17	Basic treatment for patient	0.48

Conclusion

The research found that competency-based assessment of public health professionals comprised of 3 core competencies and 30 items. The first: health care analysis and management competencies, consists of 11 items regarding management and analysis in public health area. The second,public health professional competencies consists of 11 items regarding knowledge identify public health professional and ethics. The third, basic health sciences competencies consist of 8 items regarding basic sciences for health. The core competencies from this research provide an excellent framework for the research in the future. Which competency-based assessment that can be synthesized from the analysis by EFA from the opinions of the workers, these clear connections to practice moves public health professional closer to valid competency-based on population need and consistent with the actual work.

Implications for their practices including 1) to provide information for both practitioners and policy makers about the competency of public health professionals and propose policy options to producing and developing public health professionals in Thailand and 2) to reflect the development of public health professional in terms of the development of work potential and education management guideline in the future and 3) provide information for public health program curriculum development in Thailand.

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Does Vertigo Predict Hypertension in Cervical Spondylosis Clinical Trail Study

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Abstract

Background: Both cervical spondylosis and hypertension are common medical conditions. That is whether spondylosis leads to hypertension and whether vertigo could predict hypertension is not clear.

Objective: To identify the relationship between cervical spondylosis & systemic hypertension through identification of probable predictors .

Patient and Method: All patients were seen in AlMowasat outpatient clinic from January 2017 to August 2019 with symptomatic cervical spondylosis. All of them were evaluated for presence of hypertension along with signs and symptoms of cervical spondylosis. Diagnosis of cervical spondylosis was based on clinical criteria and radiological findings.

Result: A total of 50 patients(31 males and 19 females) were studied. Hypertension was ascertained in 29(58%).Common signs and symptoms of cervical spondylosis were evaluated including headache in 89.4%, vertigo in 83.7%, chest pain in 55%, shoulder pain in 61.9%, numbness in 65.1%,abnormal reflexes in 44.7%, Babiniski sign in 17% and Body Mass Index ≥30 in 60.4%).Logistic regression analysis indicated that vertigo is significant independent predictor of hypertension in cervical spondylosis patients.

Conclusions: Vertigo was a predictor of hypertension in spondylotic patients.

Keywords: *Cervical Spondylosis, Hypertension, Vertigo.*

Introduction

Cervical spondylosis is a degenerative disease affects intervertebral disc at different levels with osteophytes formation.[1] Symptoms of cervical spondylosis are variable including headache, numbness, weakness of extremities[1] and others but vertigo is most common symptom.[2] Surprisingly cervical spondylosisis common among patients complaining of vertigo. [2] but the links between the two conditions are unclear. The disease is age related disorder increasing with age where it is about 13%, 34%, 58% in the fifth,sixth, and seventh decades in that order[3], yet many individuals above 30 years, show significant abnormalities on plain x ray[4]. Hypertension is common worldwide problem.[5]

About 95% of hypertensive patients have no identifiable causes[5] obesity is one of common cause of secondary hypertension[6]

Hypertension is often asymptomatic[5], the overall prevalence of hypertension in nearby cities or countries is around 26.5%[7] 10%[8], 10.3%[9] and 22%[10] in ThiQar (north of Basrah city), Saudi Arabia,Kuwait & Iran respectively

The aim of this study is to evaluate the association between cervical spondylosis and systemic hypertension through probable mediators such as vertigo.

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Patients and Method

This was a cross-sectional study carried out in one major private hospital in Basrah city (Al Mowasat hospital)lasted for twenty months. Patients who met the criteria of having cervical spondylosis both clinically and radiological were included in the study. The study started from January 2018 until August 2019. Diagnosis of cervical spondylosis depended on radiological changes on cervical x- ray and signs and symptoms. Each patient was analyzed for symptoms of cervical spondylosis which including headache,vertigo, numbness shoulder pain, chest pain plus signs like abnormal tendon reflexes, Babinski sign, Lhermitte's sign .Both compression and traction tests were elicited. Body mass index was evaluated at same time. For each patient, blood pressure was measured with mercurial sphygmomanometer after patients waited for at least five minutes prior to each record. Recorded blood pressure often needed two separated occasions.

Hypertension was defined as blood Pressure ≥140/90 mmHg[5] or patients on anti- hypertensive medication

Vertigo was defined as rotatory movement either bodily or environmental or according to clinical examination compression tests were performed either by axial compression on the head with neutral head position or rotational movement on extended head, symptoms made worse by these movement indicated a positive test[11] traction test provoked by head traction, symptoms relief signified a positive test[11] diabetes mellitus diagnosed by history of diabetes mellitus, the use of insulin or other hypoglycemic agents or measurement of fasting blood sugar ≥126mg/dl or random blood sugar ≥200mg/dl.

Body Mass Index (BMI) is the value derived from weight and height as Weight in kg/Height inM2). 12 Underweight patients, considered when BMI under 18,5 kg/M2 while BMI between 18,5 kg/M2 to 24.9 kg/M2 considered as normal, Overweight patients considered when BMI is 25 to 29.9 & BMI ≥ 30 is indicating obesity.

Babinski sign defined as dorsiflexion of big toe or fanning of the other toes upon stimulation of lateral planter aspect of the foot[12]

Lhermitte's sign is a sense of electric shock in extremities provoked by neck flexion[13] radiological finding of cervical spondylosis are including narrowing disc space & marginal osteophytes[14], opinion of radiologist was obtained in controversial instances.

SPSS version 21 was used.,Chi-square with significant value of <0.05 adapted to assess the predictors of hypertension in cervical spondylosis. In addition logistic regression analysis was used to identify significant predictors of hypertension

. Of the 50 patients with cervical spondylosis, 31 (62%) patients were males, and 19 (38%) were females, thus the male to female ratio was 1.6:1. The mean age was 51.2 ±10.1 years with a range of 32-72 years .

The hypertensive patients were distributed as 29 males and 9 females .The majority of patients complained of headache which was observed in 42(89.4%). Others symptoms with relatively higher frequency were vertigo seenin 36 (83.7%). Numbness was seen in 28(65.1%)

While Chest pain was seen in 22 (55%). BMI analysis showed that Obesity was prevalent in 29(60.4%).

Evaluations of signs concerning cervical spondylosis were shown also. Abnormal reflexes were,observed in 17 (44.7%), Lhermitte's sign observed in 13 patients, Babinski sign elicited in 7 patients(17%).Diabetes was ascertain in 9 patients.

Logistic regression analysis to predict hypertension shows that only vertigo is independent and significant predictor of hypertension with p value of 0.026 (Table 1).

Table 1: Logistic regression analysis predicting the hypertension in Cervical spondylosis

Variable	B	S.E.	WALD	DF	SIG	EXP(B)
Sex	1.027	1.748	.345	1	0.557	2.793
Headache	3.183	2.485	1.640	1	0.200	24.108
Vertigo	3.985	1.791	4.949	1	0.026	53.768
Numbness	-1.967-	2.688	.535	1	0.464	.140
Age	.167	.106	2.492	1	0.114	1.181
Lhermitte's sign	.021	1.398	.000	1	0.988	1.021

Variable	B	S.E.	WALD	DF	SIG	EXP(B)
BMI	2.673	1.539	3.014	1	0.083	14.479
Shoulder pain	-1.101-	1.566	.494	1	0.482	.333
Constant	-20.990-	11.848	3.139	1	0.076	.000

Discussion

The correlation between cervical spondylosis and hypertension had been studied since few decades in different aspects.

50 years ago Al Badran et al, reported that headache in hypertensive patients if not relieved by reduction of elevated blood pressure, is likely attributable to cervical spondylosis[15]

Liu & Ploumis in study published in 2012 reported that cervical spondylosis could be a possible cause of hypertension, they found more than one third of hypertensive patients are no longer need antihypertensive medicine after decompressive cervical surgery and created a term cervicogenic hypertension [16]

A Chinese study[17] by Peng B et al (2015) described some association between hypertension and cervical spondylosis, they found also that surgical treatment of cervical spondylosis had successfully controlled hypertension, This study was, however, with limited number of patients(two patients only) but, interestingly they reported important point,whichis,surgical decompression of degenerative disc that contributing to cervical spondylosis is relieving hypertension as well as vertigo.In these two patients.

Our observations showed vertigo is independent predictor for hypertension .but vertigo is commonly seen in patients with cervical spondylosis[2]. On the other hand, studies of vertigo in hypertensive patients did not indicate that elevated blood pressure was causing vertigo,(but if existed together) it commonly attributable to other concomitant causes like central nervous system or vestibular diseases.[18]

Marchiori L,et al found that incidence of vertigo in hypertensive and non hypertensive patients were similar and concluded that no correlation of vertigo with hypertension could be ascertained.[19] In the present study and according to the logistic regression analysis to predict hypertension, vertigo was the only significant (P=0.021) and independent predictor .in spondylotic patients. Such results clearly denoted that vertigo carried significant impacts in hypertensive patients in complex mechanism need further evaluation or indeed the presence of vertigo could be accidental or possible explanations are the hypotension provoked by antihypertensive medications[18] or concomitant vertebrobasilar insufficiency due to atherosclerosis in hypertensive patients . It remains plausible however to conclude that the presence of vertigo in cervical spondylosis patients strongly suggests coexistent hypertension.

Conclusions

The presence of vertigo was strongly predict the systemic hypertension in patients with cervical spondylosis

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Is there an Effect of Serotonin on Attention Deficit Hyperactivity Disorder

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Abstract

Background: Attention deficit hyperactivity disorder (ADHD) is a neurobiological disorder with a prevalence of 5%-10% in the world that negatively impacts school behavior and achievement. There have been many studies reveals that attention disorders are caused by the decreased levels of dopamine and norepinephrine neurotransmitter. However, particular concern nowadays are the emotional and behavioral problems. The emotional and behavioral problem is suspected to be caused by the decrease in serotonin level. The aim of this study was to determine the difference in serotonin level between ADHD and non-ADHD children.

Method: This study was an observational case-control study design using random sampling method. Subject of this study was children in Bina Karya Elementary School Surabaya. ADHD severity was assessed using Conners Abreviated Rating Scale. Examination of serotonin levels in blood was done by ELISA method. Informed consent was signed by parents before the study. Data was analyzed using independent T-test.

Results: 44 (23 ADHD and 21 non-ADHD) children from grade 1 to 6 was included in the study. Based on the gender, 13 children were girls and 31 children were boys. Serotonin level in ADHD children was significantly higher than non-ADHD children (2.148 ± 0.94 vs 2.006 ± 0.115 μmol/L; p = 0.0001).

Conclusion: Serotonin level in ADHD children was significantly higher than non-ADHD children.

Keyword: *Serotonin, ADHD, Abbreviated Conners Teacher Rating Scale.*

Introduction

Attention deficit hyperactivity disorder (ADHD) is a neurobiological disorder with a prevalence of 5%-10% in the world that negatively impacts school behavior and achievement. The onset of this disorder usually appears in the school-age[(1)]. Many parents feel disconcerted in nurturingtheir children with ADHD since they often opposed, haphazardly behave,and disobey the rules[(2,3)] Parents, especially mothers, often have to lose their jobs because they have to take care of their ADHD children[(4,5)]. Teachers at school also often complain of being confused and discouraged in educating children with ADHD because they need extra attention while there are limited teachers available and a lot of students to be supervisedat one time[(6–8)] ADHD often coexist with other disorders, such as anxiety, depression, and learning disorder due to short spans of attention, hyperactivity, and impulsive behavior[(9–12)]. Management of ADHD is multimodal, including pharmacotherapy and psychotherapy. Psychosocial therapy is also considered for parents that refuse pharmacotherapy[(6,9,13–15)]

There have been many studies reveals that attention disorders are caused by the decreased levels of dopamine and norepinephrine neurotransmitter[(16)] However,

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particular concern nowadays are the emotional and behavioral problems. It is more severe than the communication difficulties in the family, as emotional and behavioral disorders will adversely affect the entire life span of an ADHD children[17]. The emotional and behavioral problem is suspected to be caused by the decrease in serotonin level. However, study about the effects of serotonin is very limited and the results are still controversial[18,19].

Considering that the study about the effect of serotonin is very limited and the result is still controversial, authors conduct this study to determine the difference in serotonin level between ADHD and non-ADHD children.

Method

This study was an observational case-control study design using random sampling method. Subject of this study was children in Bina Karya Elementary School Surabaya. The inclusion criteria for the case group was ADHD children in class 1 to 6, the mothers were not experiencing any psychosocial stressor during the study period, and both the mothers and the children were able to communicate using Indonesian language and being cooperative during the study. The inclusion criteria for the control group was non-ADHD children in class 1 to 6, and both the mothers and the children were able to communicate using Indonesian language and being cooperative during the study. The exclusion criteria for the study was children with the others mental health condition.

ADHD scores was assessed using Abbreviated Conners Teacher Rating Scale in Indonesian version. Social Readjustment Rating Scale by Holmes and Rahe was used to assess psychosocial stressor of the mother (Holmes & Rahe, 1967). Serotonin serum level was measured using ELISA method.

Shappiro-wilk test was used for the normality test. Independent T-test was used to analyze the difference between serotonin level in ADHD and non-ADHD children. SPSS 17.0.0 for windows software, 2007, SPSS Inc. Chicago, IL, USA and Microsoft Office 2013 was used for the statistical analysis test.

This study follows the principles of the Declaration of Helsinki. This study has received recommendation from Surabaya city government office before the study begins (Recommendation Number 070/1574/436.8.5/2018). Parents were given information for consent and signed the informed consent regarding the study prior to their involvement in the study. Details that might disclose the identity of the subjects under study were omitted.

Results

Table 1: Characteristic of the Subjects' Family

		Non ADHD N (%)	ADHD N (%)	Total
Highest Education Background	Junior high school	11 (50)	11 (50)	22 (100)
	Senior high school	7 (41.2)	10 (58.8)	17 (100)
	university	3 (47.7)	2 (52.3)	5(100)
Occupation	Not work	16 (51.6)	15 (48.4)	31 (100)
	Work	5 (38.5)	8 (51.5)	13 (100)
Sufficiency of monthly income	Not sufficient	5 (50)	5 (50)	10 (100)
	Almostsufficient	6 (37.5)	10 (62.5)	16 (100)
	Sufficient	9 (56.2)	7 (43.8)	16 (100)
	Very sufficient	1 (47.7)	1 (52.3)	2 (100)
Parents relationship	Poor	0	3 (100)	3 (100)
	Good	21 (51.2)	20 (48.8)	41 (100)
Relationship among family member	Poor	0	5 (100)	5 (100)
	Good	21 (53.8)	18(46.2)	39 (100)
Family Member Social interaction	Poor	2 (66.7)	1 (33.3)	3 (100)
	Good	19 (46.3)	22 (53.7)	41 (100)

Characteristic of the subjects and the family: 21 non-ADHD children and 23 ADHD children was included in the study. Based on the gender, there were 13 girls (6 in non-ADHD group and 7 in ADHD group) and 31 boys (15 in non-ADHD group and 16 in ADHD group). From the mother highest education background, 22 parents had graduated from junior high school, 17 had graduated from senior high school education background, and 5 had graduated from university education background. Based on the occupation, 13 children had their mother worked, while 31 children had their mother not worked. From the sufficiency of the monthly income, only 18 family had sufficient monthly income. 3 family had a poor mother-father relationship, whilst 5 family had a poor family relationship (table 1).

Table 2. Serotonin Level in ADHD and Non-ADHD Children

Variable	Mean	P
ADHD	2.148 ± 0.94 µmol/L	0.0001
Non-ADHD	2.006 ± 0.115 µmol/L	

Results Table 2. The mean serotonin level in ADHD children was 2.148 ± 0.94 µmol/L, while the mean serotonin level in non-ADHD children was 2.006 ± 0.115 µmol/L. Normality test showed that the data distribution was normal. Using independent T-test, it was found that serotonin level in ADHD was significantly higher than non-ADHD children (p = 0.0001, 95%CI = 0.780-0.206).

Discussion

From the demographic data of the subjects, there were 16 boys and 7 girls with ADHD. This result is consistent with the results of previous studies which found that the prevalence of ADHD was greater in boys[6,20,21]. Psychostimulant methylphenidate (MPH) and amphetamine (AMPH) are the first-line ADHD drug choice[22–25] Both of these drugs primarily work on dopamine (D2) and noradrenaline (NA) system, but not on the serotonin system[8,26]. More than half of the subjects did not respond positively to the administration of this psychostimulant[6,27] Not all parents agree with methylphenidate that affects appetite and inhibits growth when given to their children and also the risk of drug dependence or abuse on long-term use with adolescent subject[28].

Serotonin selective reuptake inhibitors (SSRIs) that working in the serotonin system are the second-line treatment in ADHD management[13,29–33]. This fact becomes the basic etiologic hypothesis of serotonin to ADHD. Based on these results, hypotheses suggest that chronic serotonin deficiency causes hyperactivity and impulsivity symptoms in ADHD (19). The etiology of serotonin in ADHD up to now is not clearly known on brain imaging studies it was found that serotonin especially in the prefrontal area of the cortex contributes to the clinical symptoms of ADHD[6,32] Prefrontal cortex plays a role in regulating attention, cognitive function, emotional regulation and motivation(34,35) Serotonin plays an important role in the development of the nervous system in early child development and has a different role with serotonin in adulthood Serotonin affects the symptoms of hyperactivity and impulsivity but has no effect on[34,35]. The statistical analysis of serotonin revealed a significant differences between ADHD and non-ADHD subjects. These new findings may provide input for alternative pharmacotherapy management other than methylphenidate because not all parents agree with the administration of these drugs that have side effects on decreased appetite and inhibit the growth of the child.

Conclusion

Serotonin level in ADHD children was significantly higher than in non-ADHD children.

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Different Grades of BMI is Correlated with Left Atrium and Ventricle Structure in Patients with Hypertensive Heart Disease

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Abstract

Background: Hypertensive Heart Disease (HHD) is usually followed by cardiac remodeling. Different grades of Body Mass Index (BMI) also influence the cardiac structure. Hence, we evaluate the cardiac structure of HHD patients with various BMI grades.

Materials and Method: This cross-sectional study involves 50 consecutive patients with HHD (hypertensive heart disease) from the Cardiology and Vascular Medicine Departement, Soetomo General Hospital Indonesia. Echocardiographic examination was done using GE vivid 7. Statistics were evaluated with SPSS 25.0.

Results: The research showed that the grades of BMI (body mass index) was positively correlated with LA major (r=0.335), RA Major (r=0.371), LVD Mass (r=0.341), LVS Mass (r=0.303), LVPWD (r=0.369), LVPWS (r=0.391), and inversely correlated with LVSI Dopp (r=-0.376). Obese (BMI>30) patients have significantly lower ejection fraction compared to normoweight (BMI<25) patients (64.3±3.67% vs 62.12±0.98%, p=0.046).

Conclusions: The grades of BMI in the HHD patient is associated with an increased volume of the left atrium and ventricle. This suggested that obese patient with HHD should be assessed carefully for atrial and ventricle enlargement.

Keywords: *Cardiac Structure, Echocardiography, Hypertension, Obese, Remodelling.*

Introduction

Hypertensive heart disease (HHD) can be manifested as asymptomatic cardiac hypertrophy to clinical heart failure. Alteration of blood vessel and cardiac structure in the HHD was caused by the chronic elevation of the blood pressure.[1] This remodelling subsequently contribute to the pathophysiology of circulatory disorders in the HHD patient.[2] The progression of cardiac structure remodelling in the HHD patient is influenced by various factor such as type of overload, neurohormonal activation, co-existence with other diseases and genetic factors.[3]

Obesity rates are rising worldwide. Obesity is defined as abnormal or excessive fat accumulation that may impair health, including increased risk of cardiovascular disease and hypertension that may

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induce some changes in cardiac structure and function. World Health Organizations (WHO) and National Institute of Health defines Normal weight as BMI 18.5-24.9, Overweight as BMI 25-29.9, Obesity as BMI $\geq$ 30 kg/m^2, severe obesity as BMI $\geq$ 40 kg/m^2, and super obesity as BMI $\geq$ (50 kg/m^2).[4] Obesity may also induce several modifications in cardiac structure and function in the absence of other atherosclerotic risk factors, to the extent that some authors have suggested the specific form of "obesity cardiomyopathy," which resulted in left ventricular (LV) structural and functional abnormalities.[5] Obesity is well known to imply some cardiac consequences with the inducement of several modifications in cardiac structure and function, which are associated with hemodynamic volume overload. Atrial and ventricular remodeling is common in obese patients, and this pathophysiological change plays a pivotal role in atrial and ventricular dysfunction.[6]Hence, it is hypothesized that different grades of BMI may contribute to the cardiac remodeling progression in the HHD patient. This research investigates whether different grades of BMI status is correlated with echocardiographic findings in HHD patient.

Materials and Method

Research Design: This retrospective study consisted of subject $\geq$ 18 years old with hypertensive heart disease evaluated at the Echocardiography Laboratory of the Department of Cardiology and Vascular Medicine Dr. Soetomo General Hospital, Surabaya, Indonesia between January 2018 and January 2019. Eligible patients required to have LV Ejection Fraction (EF) $\geq$ 50%. Normal weight, overweight, and obesity were defined according to body mass index (BMI) established criteria.[4] Diabetes mellitus and hypertension were defined according to current recommendations.[7-8]Patients were excluded if they had a history of acute coronary syndromes, angina, or revascularization procedures or evidence of segmental wall motion abnormalities at echocardiography, or a history of heart failure. Other exclusion criteria were significant aortic or mitral valve disease, severe mitral annular calcification, hypertrophic cardiomyopathy, secondary forms of cardiomyopathy, stroke, peripheral artery disease, and chronic kidney disease.

Doppler Echocardiography: Transthoracic two-dimensional and Doppler echocardiographic examination was carried out by Vivid S6, Logic E9, and Vivid S60 Ultrasound instrument (General Electric) with 2nd-harmonic imaging and a 3.5-MHz transducer. Patients were examined in the left lateral decubitus position, and data were acquired in the parasternal (long-and short-axis views) and apical views (two chambers (A2C) and four chambers (A4C) and apical long-axis views). In every echocardiographic evaluation, all parameters were derived according to current indications and considered in relation to their established reference ranges. Left ventricular volumes and EF were calculated from apical A2C and A4C views using the TEICH and Modified Simpson's Biplane rule. LV mass was calculated and indexed according to body surface area and height. Left atrial (LA) and Right atrial (RA) size were also measured by major and minor dimension. Relative wall thickness (RWT) was derived as the ratio between 2 multiplied posterior wall diastolic thickness and end-diastolic diameter. Pulsed wave Doppler mitral velocity curves were obtained from the A4C view by positioning sample volume between the tips of the mitral valve leaflets in diastole. From mitral velocity tracings, peak early (E) and late (A) transmitral flow velocities, their ratio E/A, and E-wave deceleration time (EDT) were measured accordingly. From A4C view, tissue Doppler longitudinal velocities were recorded with the sample volume placed at the junction between LV wall (medial and lateral) and the mitral annulus. The ratio of mitral E peak velocity and averaged ratio of mitral to myocardial early velocities (E/e′) was calculated. The peak tricuspid regurgitation (TR) velocity was measured from the maximal velocity of tricuspid Doppler regurgitant jet. To derive stroke volume and cardiac output using Doppler method, continuity equation at LV outflow tract and velocity time integral were used.[7,9,10]

Statistical Analyses: Statistical analyses were performed using IBM SPSS Statistics 25.0. Data are considered significantly different if $p<0.05$. Continuous variables, presented as mean±SD, were evaluated for normal distribution and compared using the ANOVA test, as appropriate. The correlation was evaluated with Spearman Rho analysis followed by multiple stepwise linear regression test to determine Beta Coefficient and R-square.

Findings:

Demography of HHD patients: The echocardiographic finding was obtained from 50 HHD patients with demography as follow:

Table 1. Characteristic of the HHD patients

No.	Description	n (%) or mean±SD
1.	Age (Years)	60.34±9.83
2.	**Gender**	
	a. Male	13 (26%)
	b. Female	37 (74%)
3.	Body Height (cm)	155 ± 6.24
4.	Body Weight (kg)	62.63 ± 11.88
5.	**Weigh Classification**	
	a. Normoweight	24 (48%)
	b. Overweight	18 (36%)
	c. Obese	8 (16%)
6.	Systolic Blood Pressure	137.5 ± 24.35
7.	Diastolic Blood Pressure	80.0 ± 7.56

Echocardiographic Findings from HHD Patients

Table 2. Significant Difference in Echocardiographic Findings of HHD patients

No.	Description	BMI < 25	25 ≤ BMI<30	BMI >30
1.	LA Major	4.55±0.71[b]	5.10±0.69[a]	4.93±0.29
2.	RA Major	3.92±0.69[b,c]	4.35±0.59[a]	4.52±0.25[a]
3.	Ejection Fraction	64.3±3.67	66.51±4.01[c]	62.12±0.98[a,b]
4.	LVD Mass	140.21±36.58[c]	161.59±39.61	194.93±58.05[a]
5.	LVS Mass	126.02±29.39[c]	140.77±41.91	173.68±46.29[a]
6.	LVSI Dopp	50.36±6.76[b]	44.15±10.32[a]	44.30±7.54
7.	LVPWD	1.00±0.14[c]	1.11±0.21	1.29±0.35[a]
8.	LVPWS	1.39±0.15[c]	1.49±0.22[c]	1.71±0.36[a,b]

Comparison of the echocardiographic finding of normoweight (BMI<25), overweight (25 ≤ BMI<30), and obese (BMI >30) patient with HHD. Different annotation showed a significant difference ($p<0.05$) if compared with normoweight (a), overweight (b), obese (c).

As shown in Table 2 above, Significant difference was observed between normoweight and overweight patient in LA Major, RA Major, and LVSI Dopp ($p<0.05$). Comparison between normoweight and the obese patient showed a significant difference in RA Major, LVD mass, LVS mass, LVPWD, and LWPWS ($p<0.05$). Comparison between overweight and obesity only showed significant difference in Ejection Fraction and LVPWS ($p<0.05$).

Table 3. Correlation Between BMI with Echocardiographic Findings of HHD patients

No.	Description	Correlation	Beta Coefficient	R-Square
1.	LA Major	0.335*	0.310*	0.055
2.	RA Major	0.371*	0.359*	0.111
3.	Ejection Fraction	-	-	-
4.	LVD Mass	0.341*	0.393**	0.137
5.	LVS Mass	0.303*	0.362*	0.113
6.	LVSI Dopp	-0.376*	-0.313*	0.079
7.	LVPWD	0.369**	0.403**	0.145
8.	LVPWS	0.391**	0.401**	0.143

Annotation * showed significance at $p<0.05$ and ** showed significance at $p<0.01$

As shown in table 3 above, Positive correlation was shown between different grades of BMI with LA Major, RA Major, LVD Mass, LVS Mass, LVPWD, and LVPWS. Inverse correlations can be observed only on LVSI.

Discussion

Obesity induces several modifications in cardiac structure and function, which are associated with hemodynamic volume overload. Atrial and ventricular remodeling is common in obese patients, and this pathophysiological change plays a pivotal role in atrial and ventricular dysfunction.[6] In this research, we found that comparison between obese patient has significantly higherRA Major, LVD mass, LVS mass, LVPWD, and LWPWS. Previous longitudinal research has demonstrated that increasing BMI for 5 units from normoweight patient in the 4 years, can significantly increase the LA and LV compared to patient without increased BMI.Other cross-sectional studies also demonstrated that obesity and greater BMI are correlates with the larger LA dimensions.[11] Previous research also showed that patient with lower BMI (BMI <18.5) will also followed by significantly lower LVMI and smaller LV mass.[12] This suggested that atrial and ventricular dimension are increased in the HHD patient as BMI grades increased.

Correlation test also showed that different grades of BMI are positively correlated with LA Major, RA Major, LVD Mass, LVS Mass, LVPWD and LVPWS, suggesting that higher BMI grades will affect the volume of the left atrium, right atrium and left ventricle. Aditionally it will also affect the systolic and diastolic function of left ventricle. Previous research also showed similar finding, which found a linear correlation between increased LV mass (g/m2) with BMI.[13] It was also shown that increased BMI is related to both LV systolic and diastolic dysfunction.[6] However, another study showed that obesity might not follow by increasing the LV Mass if the obesity is followed by confounding disease, which can alter the hypertrophic progression such as myocardial infarction. [14] This suggested that in the patient with HHD, increasing BMI is associated with atrial and ventricular enlargement and HHD may not alter the hypertrophic progression of the heart muscle.

There are several limitations to our findings. Firstly, obesity was only measured through BMI rather than the direct measurement of central obesity, such as abdominal circumference or waist and hip circumference. While many studies have shown that central obesity measurement is more robust predictors of cardiovascular outcomes, this suggested that more detailed metrics of central adiposity will be important to be considered in future studies.

Secondly, our sample size was limited and not equally distributed between underweight, normoweight, overweight, and obese which might affect lack of significance in cardiac dimension measured through echocardiography. More samples with better distribution among the BMI grades would be beneficial for future research. Thirdly, as the data only derived from single cardiology center in urban area, the data may not be representative or generalizable to other populations

Conclusion

BMI grades is associated with the functional and structural changes such as LA Major, RA Major, LVD Mass, LVS Mass, LVPWD and LVPWSin the heart of HHD patients.

Conflict of Interest: The authors declare no conflict of interest

Source of Funding: This research received no external funding

Ethical Clearance: The research was conducted in accordance with the Helsinki declaration of 1975 as revised in 2000. All participating patient has signed written informed consent. The study protocol has been approved by the local ethics committee. Data which shows patient personal information was omitted.

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Herbal Dental Products: The Impact of Social Media on Consumers' Behaviour

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Abstract

The increasing demand for having an attractive smile becomes one of the life essentials. Oral hygiene maintenance plays a key role in maintaining oral health (healthy teeth and gum) and as a result, having an attractive smile. Thus, using routine dental cleansing through brushing, flossing and mouth rinsesis mandatory.

This study aims to evaluate the role played by social media on consumers' behaviour to use dental products manufactured essentially from herbal products rather than the well- known chemical formula. The analyzed data were collected by using a face-to-face approach (unstructured interviews). At first, dentists and pharmacists were asked about their opinion regarding using herbal products and their response to social media campaigns. Then,a random sample of the audience was interviewed.

Results showed that most of the Iraqi peoples are familiar with herbal products (68.6%) of them indicated social media has an impact on individuals.

The awareness of the importance of using toothpaste and mouth rinses made from herbal products can be increased through introducing their effectiveness, reduced side effect and their importance as green substrates…etc. This can be done by organized campaigns by a pharmaceutical company or nonprofit organization.

Keywords: *Herbal, dental products, social media, behaviour, influencers.*

Introduction

Potent therapeutic agents may be developed from medicinal plants through its active substances[(1)]. Ancient civilizations have used plants to cure a variety of human ailments[(2)]. Nowadays, over 50% of the modern drugs industry focuses on natural products which play an important role in drug development[(3,4).]

Many of these plants have dental care properties like *Azadirachta indica* (Neem), *Melaleuca alternifolia* (Tea Tree Oil), *Grita Kumari* (Aloe Vera)… etc[(5,6)]

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Historically, herbal products have been used as an oral hygiene maintenance routine. The chewing stick (Miswak or Siwak) is a tradition inherited from prophetic medicine [(7)].

Furthermore, in Asia, Africa, the Middle East, and the Americas, for thousands of years, chewing sticks prepared from twigs, stems or roots of a variety of plant species have been practiced despite the widespread use of toothbrushes and toothpaste[(8).]

As the side effect of allopathic medicines has increased, studying medicinal plants is also increased in different parts of the globe. Health professionals are often challenged to explore relevant information to advise their patients about using these over-the-counter products safely. The use of herbal extracts in various

forms is entirely consistent with the primary health-care principles because these ingredients work more in harmony with the body instead of fighting against it as seen in other conventional versions of the same herbal products [9].

Consumer behavior defined as a sequence of physical, mental and emotional activitiesdone by humansduring selecting, purchasing, using, deciding and disposing of goods and services to satisfy their needs [10].Marketing campaigns can be considered as leading factors affecting consumer behavior which helps companies and nonprofit organizationsto predict consumer personal preferences and purchasing power[11].

Social media nowadays play an essential role in improving consumers' satisfaction starting with the initial stages of information search, alternative evaluation, purchase decisions and ending with changing consumers' opinions and interest [12]. Thus, understanding the impact of social media inclarifying the benefit of herbal dental products over the chemical formula will help in increasing awareness of the people about the importance of using these products. This knowledge may end with reducing side effects that came from chemical products and substantially saving more money.

Methodology

Study Design: This study based on individuals' opinions obtained from face to face interviews with a random sample of dentists,pharmacists, and consumers to draw an image oft heir opinion about herbal dental products and to identify the role played by the advertising campaigns on social media to affect their purchasing behavior.

20 questions with 'yes' or 'no' closed-ended responses were designed and asked three hundred peoples; these questions were build based on literature review.

Study Samples: Face to face interview was conducted from February 2019 to May 2019 in Baghdad/ Iraq at two stages; the first stage included 100 dentists and 100 pharmacists. While the second stage was with 100 consumers asking them about their opinion about herbal dental products.

Results

Descriptive statistics were used to analyze the results of this study using Version 21, SPSS software.

The chemical dental products show the highest rate of use among dentists (38.3%), while the herbal products used more by the other customers (58%) (Fig.1).

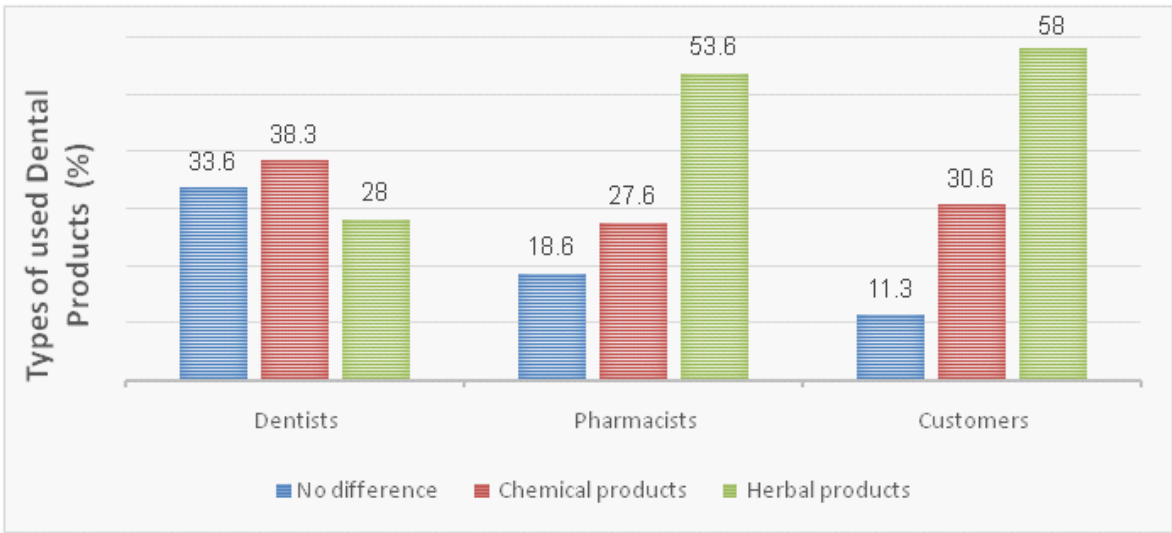

Figure 1: Types of used dental products

In (Fig. 2 and 3), reasons behind preferring herbal products over the chemical product and vice versa. Safety (47.6%) was the major reason behind using herbal dental care by the dentists. Whereas manufacturer reputation (brand) (63.3%) reported being the reason behind using chemical dental care products.

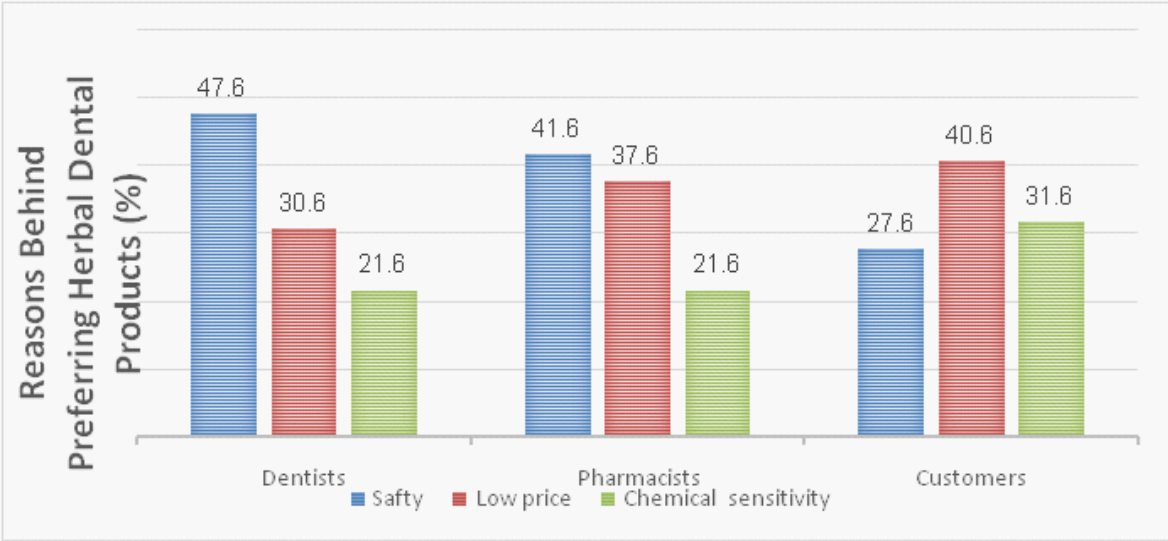

Figure 2: Reasons behind preferring herbal dental products

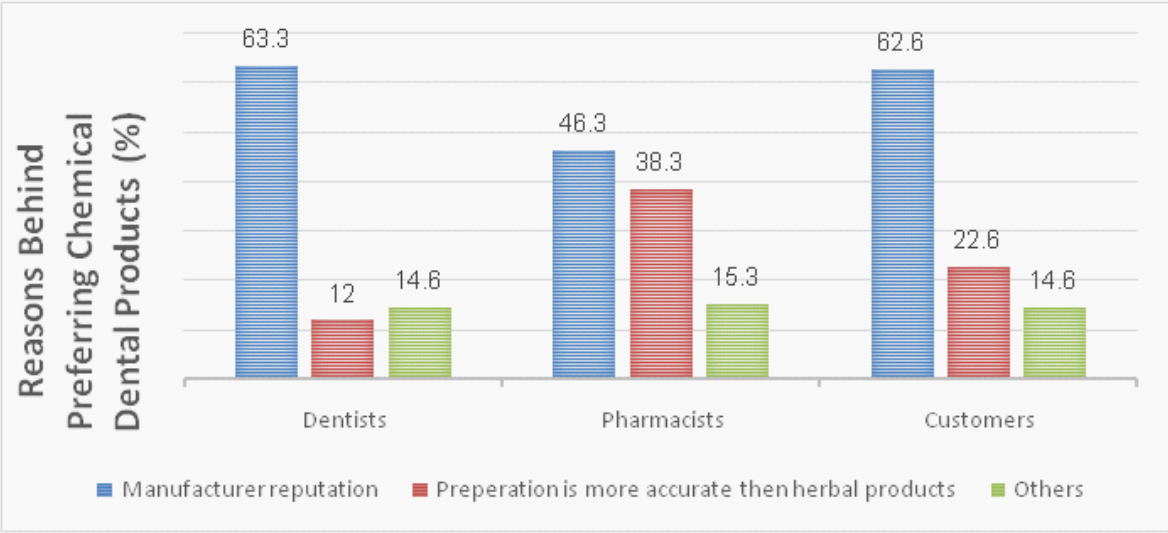

Figure 3: Reasons behind preferring chemical dental products

The majority of the sample were females (57%). The age of the majority of the sample was between 18-30 years old (28.6%) (Fig. 4).

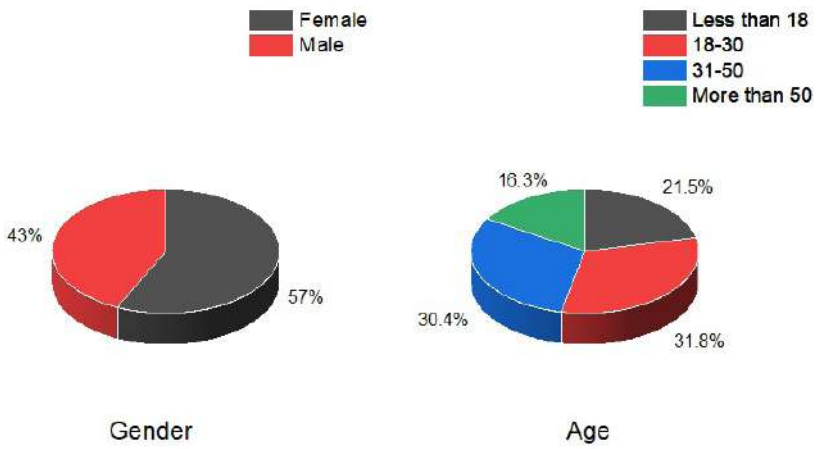

Figure 4: Gender and age of the study sample

Results reported that social messages via social media have played an essential role in changing the consumers' thoughts to use the herbal products by (68.6%) mostly via Facebook (31.6%) Where Twitter reported to be the least social media visited by people in Baghdad-Iraq (8.6%). These social sites were viewed daily by the majority of the study sample (58.6%) (Fig.5 and 6).

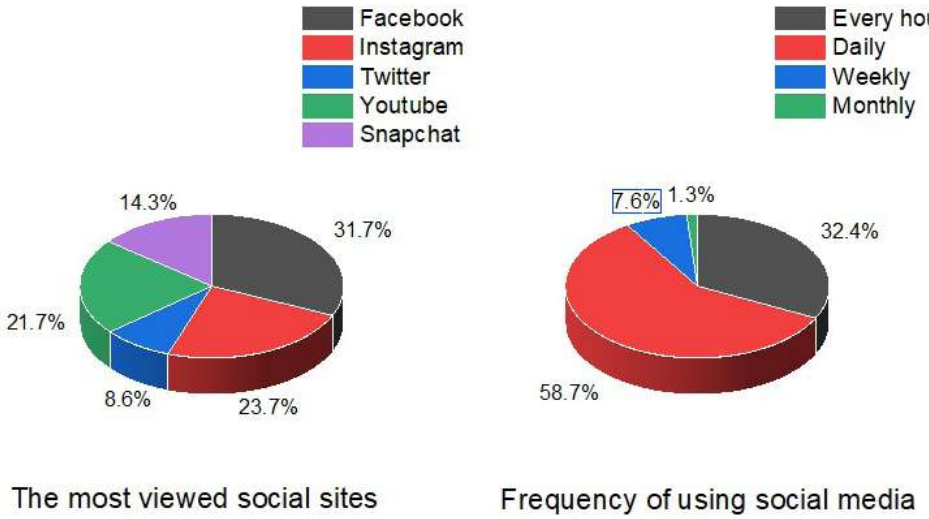

Figure 5: Most vied social media and the frequency of usage

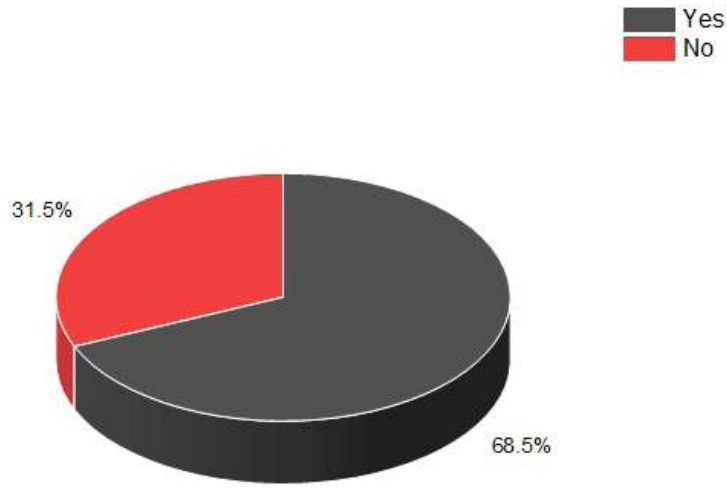

Figure 6: Social sites role in changing the consumers' thoughts to use herbal dental products

Discussion

As stated in the literature, medicinal herbs are a potential source of therapeutics aids in health systems all over the world in the diseased condition or as potential material for maintaining proper health. Therefore, the herbal product's popularity has increased[5].

This research focused on understanding the general orientation of people in Baghdad-Iraq toward herbal dental products and the reasons behind these beliefs. The collected data from dentists, pharmacists, and other consumers reported that herbal dental products are used frequently mainly because of its safety, low price and finally as a substitute to the chemical products as there is an idea that chemical compounds may be cause sensitivity. Furthermore, the data reveals a percentage of people that use both chemical and herbal products. While some peoples use the chemical formula as a result of the manufacturer's reputation. (Fig. 1,2 and 3)

Generally, women are more interested in their appearance then men, that is why most of the study sample were females between 18-30 years old(Fig. 4).

The second aspect of this study deals with the impact

of social media on consumers' behavior toward herbal dental products; therefore, the frequency of using social media and which media is most visited is important. Data regarding these questions revealed the majority of the study sample used social mediaon a daily basis. Facebook and Instagram reported being the most visited social sites (Fig. 5 and 6).

Recent studies mentioned social media as a vital tool for people between 18 to 40, as they enter young adulthood,focus on the future and aware of how others see them. They feel more pressure to be "the best", are more worried about what others think about them, and are more concerned about what making their family and friends proud, as known up to 91%of social media account are in this age group with the most social media connections. These groups are the most affected by social media's on their lives[13].

Conclusions

1. Herbal dental products used widely by peoples regardless of their levels of education.
2. Social media can direct the audience toward a specific product when used correctly towards the targeted audience via the proper social site.

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Conflict of Interests: The authors declare that there is no conflict of interests regarding the publication of this paper.

Funding Source: The authors have no funding to report.

Ethical Clearance: Not required

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The Effect of Moringa Oleifera Flour Given for Mothers Breastfeeding Against Morbidity of Baby Ages 0-6 Months in Jeneponto District

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Abstract

Background: Moringa oleifera is one of the vegetable food sources which has many nutritional content (minerals, vitamin A, vitamin C and vitamin B, sources of calcium, protein, potassium, and iron, amino acids such as methionine and cystine) which are very important to prevent disease.

Aims: To assess the large difference in infant morbidity from groups of mothers who received Moringa oleifera flour and groups who received iron tablets.

Method: : Experimental with Randomized Double Blind design, Controlled design. The population in this study were community groups of pregnant and lactating women, a large sample of 20 pregnant women each group (Moringa Oleifera flour (GTK, n = 20) and received iron folate capsules (GBF, n = 20)). Bivariate analysis uses chi-square and multivariate logistic regression to see the value of OR.

Results: There is a significant effect of moringa flour intervention on Morbidity of Infants aged 3 months ($\rho = 0.018$) and 6 months ($\rho = 0.006$). Based on the Odds Ratio test, the use of Moringa flour 5,500 times better for infant morbidity compared to the use of iron (Fe) tablets at 3 months of age and the use of Moringa flour 7.857 times better for infant morbidity than the use of iron (Fe) tablets at the age of infants 6 months are measured based on the morbidity of children in the last 3 months.

Conclusion: There is an effect of the intervention of Moringa flour on infant morbidity, the use of Moringa flour is better than the use of iron tablets (Fe). Moringa flour provides the same benefits as Fe and can be an alternative fulfillment of nutrition to maintain the health of children in order to avoid disease.

Keyword: *Moringa Oleifera, Iron Tablets, Morbidity.*

Introductions

Morbidity and mortality due to childhood illnesses remain a major global concern. Malaria, respiratory infections, and diarrheal diseases are the main causes of child morbidity and mortality. Preventable infections are a major cause of morbidity and mortality in CHER and children <5 years are generally affected[1]). occurrence of adverse health outcomes in children, defined as the incidence of validated morbidity (diarrhea, acute respiratory infections, or malnutrition) or severe events (hospitalization or death)[2].

Acute respiratory disease is one of the main causes of poor health in children. This includes a variety of effects, including viral and bacterial infections in the lungs and respiratory tract. This can also be caused or triggered by various risk factors, especially exposure to air pollution. Low birth weight, malnutrition and population density are also important risk factors. In developing countries, all of these risk factors continue to affect a large portion of the population, with acute respiratory disease continuing to be a ubiquitous form of childhood morbidity and one of the leading causes of

death. Upper respiratory tract diseases, such as asthma, wheezing, fever, and allergic rhinitis, have increased in many countries[3].

Progress towards nutritional goals requires high level policy commitment and broad community support. Existing food and nutrition policies need to be reviewed so that they comprehensively meet all major nutritional challenges and address the distribution of these problems in society. A further aim of the review is to ensure that nutrition is placed centrally in other sectoral policies and in overall development policies. Important factors for the successful implementation of this policy are official responsibilities by relevant government agencies, the establishment of cross-sectoral governance mechanisms, the involvement of development partners, the involvement of local communities[4].

Moringa oleifera extract is able to maintain a decreased level of serum ferritin up to 50%[5]. The administration of moringa oleifera increases the hemoglobin of pregnant women which is the same as the effect of iron/folic acid tablets. In addition, moringa oleifera can increase antioxidant levels and reduce MDA, and 8-OhdG[6]. Moringa oleifera can increase the number of PCV, HB and RBC, its use can increase the number of WBC, possible toxicological responses[7]. Micronutrient supplementation is widely used to prevent anemia during pregnancy and proves that pregnancy results are better and Moringa leaves are local plants, considered to contribute to anemia prevention [8]

Referring to the background above looking at the occurrence of conditions and based on research related to the use of moringa oleifera to support government programs on the implementation of a healthy Indonesia program with a family approach to reduce the prevalence of stunting and monitoring infant growth, it is necessary to conduct research on the "effects of Moringa flour Oleifera in pregnant women against morbidity of infants aged 0-6 months in the working area of the Tamalate health center in Jeneponto district, South Sulawesi. "

Materials and Method

This study uses an experimental method with a Randomized Double Blind design, Controlled design is part of an intervention study that began in 2017. This study was conducted in the area of Tamalatea Health Center, Jeneponto Regency, South Sulawesi. The population in this study is the community groups of pregnant and lactating women who are scattered in Tamalatea sub-district, Jeneponto regency, the number of samples followed since pregnant women is 20 pregnant women each group, the number of babies born followed by 40 with the assessment of the first group receiving Moringa Oleifera flour capsules (GTK, n = 20), the second group received iron folate capsules (GBF, n = 20). Bivariate analysis uses chi-square and multivariate logistic regression to see the value OR.

This research was carried out after obtaining approval from the Ethics Commission of the Faculty of Public Health, Hasanuddin University number UH2908199017. Before the implementation of measurements and interviews will be given an explanation of the actions to be taken for each respondent (Mother and baby). After the explanation, the respondents were asked for approval to participate in this study by signing an informed consent.

Results

Data shows that the characteristics based on (Maternal Age, Education, Maternal Occupation, Home Smoking, Child Gender, Breastfeeding, Breastfeeding Pattern).

Table 1. Characteristics of Respondents

Variable	Iron Tablet		Moringa capsules		Total		P Value
	n	%	n	%	N	%	
Mother's Age							
<26 years	5	27.8	7	38.9	12	33.3	0.728
≥ 26 years	13	72.2	11	61.1	24	66.7	
Education							
Low <12 Years (elementary or non-primary)	11	61.1	14	77.8	25	69.4	0.469
Height ≥ 12 years (SMP, SMA and PT)	7	38.9	4	22.2	11	30.6	

Variable	Iron Tablet		Moringa capsules		Total		P Value
	n	%	n	%	N	%	
Mother's Job							
Does not work	17	94.4	16	88.9	33	91.7	1,000
Work	1	5.6	2	11.1	3	8.3	
Smoking in the House							
Yes	14	77.8	15	83.3	29	80.6	1,000
Not	4	22.2	3	16.7	7	19.4	
Child Gender							
Man	9	50.0	11	61.1	20	55.6	0.737
Women	9	50.0	7	38.9	16	44.4	
MP-ASI							
<6 months	4	22.2	1	5.6	5	13.9	0.338
≥ 6 months	14	77.8	17	94.4	31	86.1	

Table 1 Shows a description of the respondents were mothers with age ≥ 26 years with a total of 24 people (66, 7%), had low category education with 25 people (69.4%), mothers with unemployed status 33 people (91.7%), there were people who smoked at home with 29 (80.6%) and still found MP-ASI <6 months 5 people (13.9%).

Table 2. Analysis of differences in morbidity of 3-month infants from groups of mothers who received moringa oleifera flour and groups who received iron folate

Morbidity of 3-Month Infants	Moringa Oleifera Flour		Iron Folate Tablets		Total	
	n	%	n	%	n	%
Never Sick Last 3 Months	14	77,8	7	38,9	21	58,3
Have been Sick the Last 3 Months	4	22,2	11	61,1	15	41,7
p = 0,018						
Odds Ratio = 5,500						

Table 2. From the statistical test results obtained ρ = 0.018, this means that there is a significant influence of the intervention of Moringa flour on Morbidity of Infants aged 3 Months. Based on the Odds Ratio test, the use of Moringa flour 5,500 times better for infant morbidity than the use of iron (Fe) tablets at the age of 3 months of the baby is measured based on the morbidity of children in the last 3 months.

Table 3. Analysis of differences in the morbidity of 6-month infants from groups of mothers who received moringa oleifera flour and groups who received iron folate

Morbidity of 6-Month Infants	Moringa Oleifera Flour		Iron folate tablets		Total	
	n	%	n	%	n	%
Never Sick Last 3 Months	15	83,3	7	38,9	22	61,1
Have been Sick the Last 3 Months	3	16,7	11	61,1	14	38,9
p= 0,006						
Odds Ratio = 7,857						

Table 3 From the statistical test results obtained ρ = 0.006, this means that there is a significant influence of the intervention of Moringa flour on Morbidity of Infants at 6 Months. Based on the Odds Ratio test, the use of

Moringa flour is 7.857 times better for infant morbidity compared to the use of iron (Fe) tablets at the age of 6 months of the baby is measured based on the morbidity of children in the last 3 months.

Discussion

Morbidity or illness in infants is something that must be avoided, because this can affect the nutritional status of the baby which can ultimately have an impact on the baby's growth. The most common cause of morbidity in young infants is infection. Infectious disease itself will be able to cause the baby to have no appetite so that it can affect its growth. Based on the results of this study, there was a significant effect of moringa flour intervention on Morbidity of Infants aged 3 months and 6 months. The use of moringa flour 5,500 times better for infant morbidity in usa 3 months and the use of Moringa flour 7.857 times better for infant morbidity compared to the use of iron (Fe) tablets at the age of 6 months of infants measured based on the morbidity of children in the last 3 months.

Morbidity of children is a leading cause of death of children in developing countries, especially in Ethiopia. Despite the marked increase in reducing infant mortality in Ethiopia, diarrhea and fever in children are still the main causes of death. In Ethiopia, the burden of child mortality is alarming and calls for decisive efforts to combat these health problems. On research[9]. Showed that the child's sex, age of the child, level of anemia, level of education of the husband, mother's employment status, marital status, breastfeeding status and area were all selected as significant risk factors associated with childhood diarrhea and fever and significantly associated with opportunities Higher morbidity in Ethiopia.

Word Health Organization (WHO) named the Moringa tree as a miracle tree, after discovering the important benefits of Moringa leaves [10]. In the results of research in the third month the use of Moringa flour 5,500 times better for infant morbidity than the use of iron tablets. This can be explained that Moringa leaves contain high iron which can optimize the growth and development of children, iron serves to help red blood cells carry oxygen throughout the body so as to maintain health. If a child becomes ill, the metabolism in the body will immediately go down. Food is needed which contains a lot of fiber, especially in children who have impaired exposure or diarrhea. Moringa leaves contain high anti-infectious, toxins and bacteria in the child's body can be overcome by consuming Moringa leaves Moringa leaves can help smooth digestion in children. When a child is sick, this anti-inflammatory will detoxify the child's body. So the child will recover quickly and be healthy again [10].

Breast milk besides being able to help in the growth process, it can also protect babies from various infectious diseases such as diarrhea and ARI. However, the results of the study found, there are infants who have been sick for the last 3 months despite being given the intervention of moringa oleifera flour capsules and Iron Tablets, this is in line with the research conducted. [11], that there is no effect of breastfeeding on the growth status of infants, the incidence of respiratory infections, and diarrhea in children aged 7-12 months.

Based on research conducted by [12]. Chronic exposure to arsenic, strong and toxic carcinogens through drinking water is a public health problem throughout the world. Because little is known about the effects of arsenic in early life on immunity, we evaluated the impact of exposure in utero on infant immune parameters and morbidity in a pilot study. The effect of arsenic exposure on the incidence of respiratory infections is only seen in boys. The findings suggest that exposure to arsenic in the uterus interferes with the development of the child's thymus and increases morbidity, possibly through immune suppression. The effect seems to be partly dependent on gender. Arsenic exposure also affects breast milk levels from trophic factors and maternal morbidity

On research[13], shows the need for integrated interventions directed during the prenatal and postnatal periods, using multi-sectoral approaches to address various factors from the community to the individual level. There is a strong need for efforts to increase adequate food intake during pregnancy accompanied by educational interventions. encourage pregnant women to receive adequate antenatal care, optimal infant and child feeding practices for growth and development, exclusive breastfeeding to prevent infections and diseases that can ultimately affect growth.

Research conducted in Malawi shows that babies who get complementary food at the beginning of 3 months of birth have an impact on infant morbidity [14]. In addition when the baby started to eat or consume solid foods, infants are particularly vulnerable to digestive problems, especially diarrhea, this happens because

of the preparation or storage of solids which are not hygienic, potentially as an intermediary for the entry of bacteria and viruses into the body of the baby and the baby's activity began to explore its environment. However, the results of research in the UK did not show a significant difference in the early age of introduction of solid food to diarrhea [15].

Research conducted by[16] comparing hygiene in urban and rural areas in Bangladesh that is that more samples from urban areas are contaminated than rural areas, urban caregivers are more likely than rural caregivers to practice hygiene, especially washing hands with soap after defecation and beforehand, giving eat children. Poor socio-economic status and dense housing, use of public toilets, use of contaminated water for drinking and washing, low levels of education or lack of proper knowledge and hygiene practices may be related to higher levels of food contamination in urban areas.

Conclusion

Morbidity or illness in infants is something that must be avoided because this can affect the nutritional status of the baby which can ultimately have an impact on the baby's growth. In this study, there was a significant effect of the intervention of Moringa flour on Morbidity of Infants aged 3 months and 6 months. Based on the Odds Ratio test, the use of Moringa flour was 5,500 times better at 3 months of age and the use of Moringa flour was 7,857 times better for Morbidity of infants compared to tablet use. iron (Fe) at the age of 6 months of the baby is measured based on the morbidity of children in the last 3 months. Moringa flour provides the same benefits as Fe and can be an alternative fulfillment of nutrition to maintain the health of children in order to avoid disease.

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Evaluation of an Experimental Poly-Methyl Methacrylate/Nano Graphene Oxide Composite

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Abstract

Aim: This study was conducted to establish a standard mixing protocol of nano graphene oxide (GO) incorporated into poly-methyl methacrylate (PMMA) to form GO/PMMA composite. Different concentrations of these composite were evaluated for biocompatibility.

Method: Three different mixing protocols were done to select optimum one to incorporate GO into commercially available PMMA. In the first protocol GO powder incorporated into PMMA powder. In the second protocol GO powder incorporated into methyl methacrylate (MMA) monomer. While in the third protocol PMMA powder incorporated into GO water dispersion. The most homogeneous protocol was the third one which was used to formulate GO/PMMA composite in a five concentrations 0%, 0.05%, 0.1%, 0.15% and 1% to form groups I-V respectively. For biocompatibility determination rabbit hemolysis test was used.

Results: The percent of hemolysis were less than 5% for all groups tested in rabbit hemolysis test.

Conclusions: GO/PMMA composite is biocompatible.

Keywords: *Graphene oxide, PMMA, mixing, hemolysis.*

Introduction

Poly-methyl methacrylate (PMMA) is an optically transparent synthetic polymer made of methyl methacrylate monomer (MMA). It has been used in dental field since 1937 till now[1]. It's used as bone cements, denture base, denture teeth, denture liners, obturators, splinting materials, temporary veneers, special trays and provisional crowns[2]. PMMA has adequate compressive strength, good color stability for a few weeks, low cost, easy manipulation and easy repair[3]. However, it has drawbacks such as low mechanical properties[4].

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Numerous approaches have been proposed to enhance the properties of PMMA. One of them is adding nanoparticles. Nano graphene oxide (GO) is one of graphene family. It's a two-dimensional carbon nanomaterial formed of a layer of single atom thick. It's closely packed into a hexagonal crystal structure that contains functional groups on the surface and at the edges[1,5]. GO has highly chemical, physical and mechanical properties that motivate extensive scientific interests.[5] Ability of graphene and its family in enhancing polymers properties is determined by many factors such as surface area of the nanosheets, homogeneity of the distribution of the nanoparticles in polymer matrix without agglomeration and strength of binding between graphene and polymer matrix. Homogeneity of distribution of nanoparticles and specifically GO in PMMA are a great challenge[6] as nanoparticles have very large surface to volume ratio lead to increases particle/matrix interface, thus increasing the effects of the nanoparticles on the overall

material properties. Agglomeration of nanoparticles leads to declination of the material properties attributed to the inclusion of voids.[7] For obtaining homogenous GO/PMMA composite many studies were done using multiple mixing protocols[8-11]. In this study three different mixing protocols were used and tested for homogeneity.

Biocompatibility is one of the important aspects considered during developing a nanomaterial polymer composite for biomedical applications. Biocompatibility is essential to avoid any adverse effect of a material on human body[12]. Considering American National Standard Institute/American Dental Association (ANSI/ ADA no 41), Rabbit hemolysis test is one of the effective initial tests of assessment of biocompatibility.

Few studies were found discussing the challenge of incorporating GO in self-cure PMMA to form homogenous GO/PMMA composite and the effect of adding different concentration of GO in PMMA on biocompatibility. Therefore, this study was conducted to evaluate the homogeneity of mixing protocol and the implication of different concentrations of GO in GO/PMMA composite on blood hemolysis. The first null hypothesis to be tested was the probability of production of nonhomogeneous GO/PMMA composite by all mixing protocol. The second null hypothesis to be tested was addition of GO in different concentrations to PMMA increase blood hemolysis.

Materials and Method

The main materials used in this study were GO and PMMA. Nano GO was prepared by improved Hummer's method according to Abdel-Motagaly *et.al* 2018[13] at Materials Science and Nanotechnology Department, Faculty of Postgraduate Studies for Advanced Sciences, Beni-Suef University, Beni-Suef, Egypt. The average thickness of GO was 1.2nm and the lateral size around 800nm. Commercially available PMMA was supplied from Acrostone Dental Manufacturer, Egypt, in the form of PMMA powder and MMA liquid monomer.

Incorporation of GO in PMMA: Three different protocols were used to select the optimum one to establish a homogeneous mix. The first protocol referred to protocol (A) was done regarding to Pahlevanzadeh *et.al*, 2019[11]. One gram of GO powder was weighted by digital balance (Electronic balance ATY224, Kyoto, Japan with 0.0001g accuracy) and added to 99g of PMMA powder in glass jar and vigorously stirred using ceramic rod. Then the jar was tightly closed and shaked for 5 minutes.

The second protocol referred to protocol (B) was done regarding to Lee *et.al* 2018[10]. One gram of GO was added to 99g MMA monomer in tightly closed glass jar. To ensure the homogenous dispersion of GO to MMA, the jar was placed in water bath in ultrasonic cleaner (Digital Codyson Dental Ultrasonic Cleaner CD4820, Henan, China) at a power of 170W and frequency of 42KHz for 64 minutes. Sonication was done in 8 intervals. The duration of each one is 8 minutes sonication and 10 minutes rest with changing the water in the water bath after each interval.

The third protocol is referred to protocol (C) was done regarding Kee *et.al* 2017[14]. The size range of PMMA powder beads was determined through manual sieve with 45μ stainless steel wire woven mesh. One gram of GO was added to 100ml deionized water in tightly closed glass jar. The jar was sonicated as mentioned before in protocol B to obtain a stable GO dispersion. Then 99g of PMMA powder was gradually added to the dispersion and vigorously stirred using ceramic rod. After that the mixture was inserted in a glass vacuum desiccator that contains calcium chloride anhydrous at room temperature for 24 hours to obtain a dried powder. The drying process was repeated till the powder weight reached 100±0.05g. After that the dried powder was crushed into a fine powder using a mortar and pestle and sieved again.

Thereafter, the produced powder and monomer from each mix (A,B and C) were used to prepare specimens used for homogeneity evaluation. Specimens of GO/PMMA composite were prepared according to manufacturer's instructions and packed in a specially constructed disc shaped split Teflon molds (0.5±0.1mm height and 15±0.1mm diameter), then covered by glass slide from one side and glass slide cover from the other side. The specimens were left to set under constant load of 5Kg at room temperature.

Homogeneity was evaluated by stereomicroscope (Leica, Microsystems, GmbH, Germany) at a magnification 40X and 80X. The most homogenous mix found was to be mix (C) and so it was used for preparation of the other concentrations used in this study.

Rabbit blood hemolysis test: The test was conducted according to ANSI/ADA no. 41. Fresh oxalated whole rabbit blood was collected from three healthy adult male

New Zealand rabbits (*Oryctolagus cuniculus*, supplied from animal house, CID Company for Pharmaceuticals and Biotechnology Research, Cairo, Egypt) with no medications and normal diet after merciful sacrificing of them (For each10ml of blood, 0.5ml of 2% sodium oxalate solution was added as anticoagulant). The blood was diluted by the addition of 8ml blood to 10ml saline and referred to diluted rabbit blood.

Five different concentrations (0%, 0.05%, 0.1%, 0.15% and 1%) were made from GO/PMMA composite to form groups (I-V) respectively. A disc shape specially constructed split Teflon molds (15±0.1mm diameter 1±0.1mm height) were used for specimens preparation.

Specimens of each group were crushed to small pieces after their setting. Sixty two (16x150ml) stoppered centrifuge test tubes (10 for each group, 10 for 1% GO dispersion, and two tubes for positive and negative control) were used. Each tube was filled by 10ml saline and 0.5g of crushed specimens from each group (for 1% GO dispersion group 0.5g of vortexes dispersion used).

Positive control (absolute hemolytic) was obtained by adding 10 ml of a freshly prepared solution of 0.1% sodium carbonate to test tube. Negative control (absolute non-hemolytic) was obtained by adding 10ml of normal saline to test tube. Then all tubes were placed in a 37°C water bath microprocessor (Digiqual-water bath DQ-WB-01, Tamil Nadu, India) for 30 minutes to provide temperature equilibrium. After that, test tubes were removed from the water bath and 0.2ml of the diluted rabbit blood was added to every tube, and mixed gently. Then all tubes were incubated (Precision incubator, Ohio, USA) for 60 minutes at 37±1°C.

Tubes were centrifuged with a centrifugal machine *(*Hetich, EBA8, Germany) for 5 minutes at 500xg. Then tubes were carefully removed from the centrifugal machine to prevent disturbing the precipitate. After that the supernatant of each tube was tested by spectrophotometry (Turner, UV/VIS, 390, Canada) to measure its optical density (O.D) under a visible light with 546μm wave length (green color). The percent of hemolysis was calculated using the following equation

Percent of Hemolysis = [(O.D test samples – O.D negative control)/(O.D positive control – O.D negative control)] × 100

Statistical analysis: Data was statistically analyzed and significance between groups was calculated by ANOVA (Post Hoc Tukey HSD) test, using SPSS 25.0 for Windows (SPSS Inc., Chicago, IL, USA). A value of $p<0.05$ was considered significant.

Results

For homogeneity evaluation, A and B mix (Figures 1 and 2, respectively) showed aggregation and inhomogeneous distribution of GO in PMMA matrix. Mix A showed higher aggregated particles number than B mix. The mix C showed no apparent GO particles in both magnifications Figure 3 and so mix C was considered as the most homogenous mixing protocol and was used to produce the GO/PMMA.

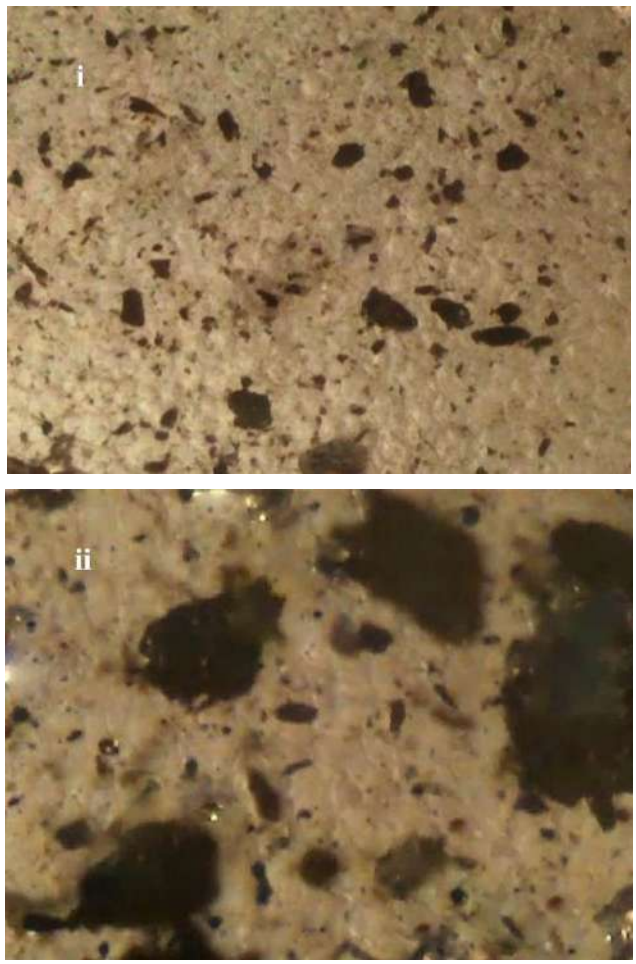

Fig. 1: Stereomicroscope evaluation of 1% GO/ PMMA composite under transmitted light for mix A (GO powder mixed to PMMA powder), (i) magnification 40X, (ii)magnification80X

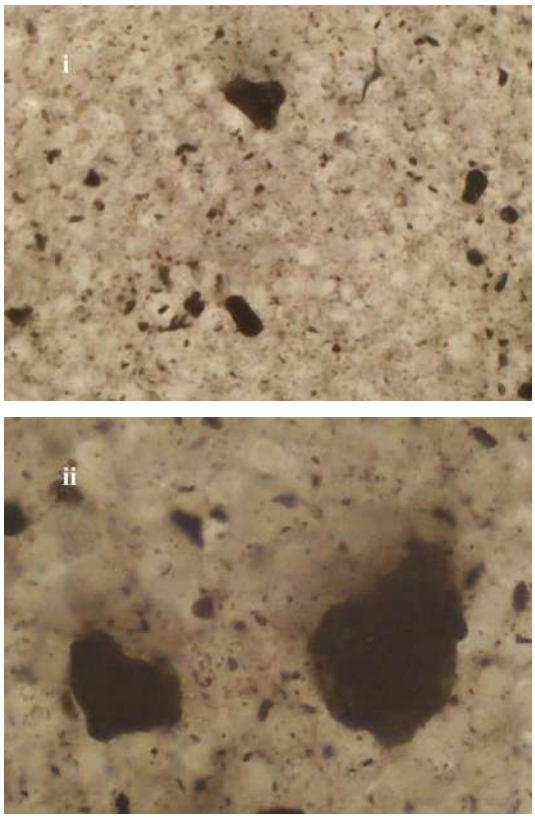

Fig. 2: Stereomicroscope evaluation of 1% GO/ PMMA composite under transmitted light for mix B (GO powder mixed with liquid MMA), (i) magnification 40X, (ii)magnification80X

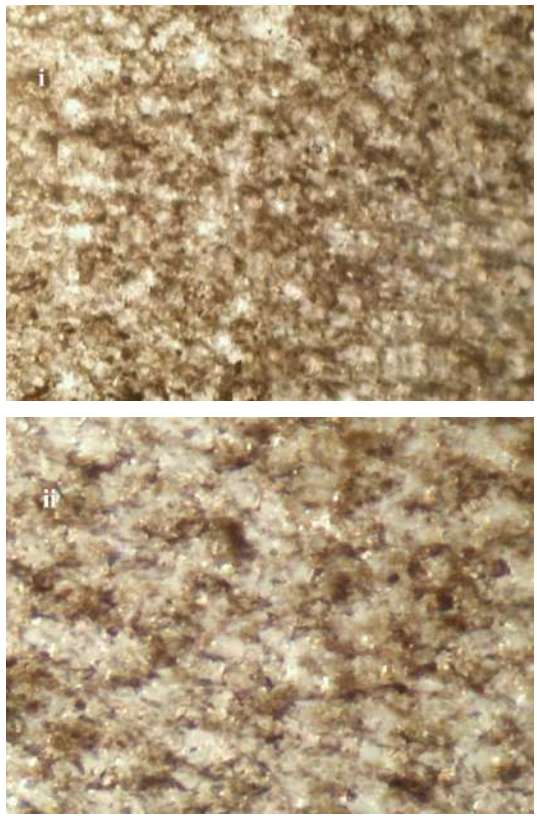

Fig. 3: Stereomicroscope evaluation of 1% GO/ PMMA composite under transmitted light for mix C (GO dispersion mixed to PMMA powder), (i) magnification 40X, (ii)magnification 80X

For rabbit hemolysis test results the 1% GO dispersion showed highest mean (2.79±0.27) among all groups. It was statistically significant to groups I (1.97±0.41), II (1.48±0.46), and III (1.72±0.45). Group II showed the lowest mean among all groups and it was statistically significant to groups IV (2.08±0.43) and V (2.19±0.3). The means of percent of hemolysis for different groups are represented in Figurer4.

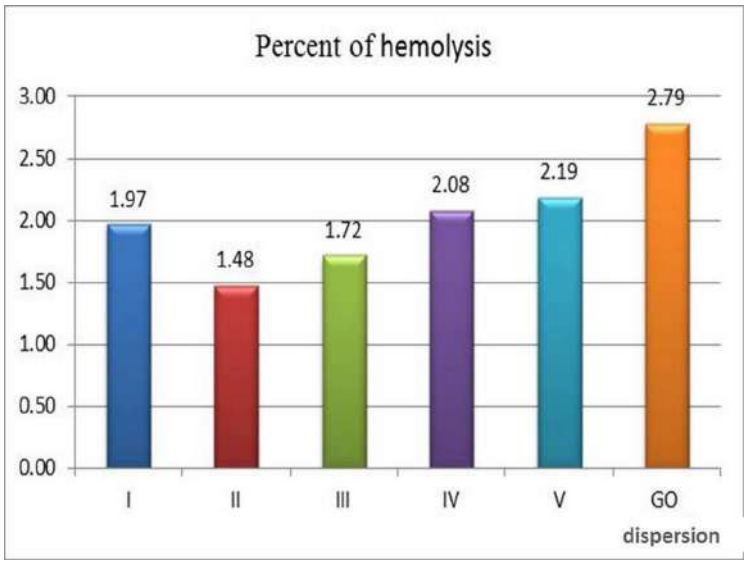

Fig. 4: Column chart show means for rabbit hemolysis test in % of different tested groups.

Discussion

This study was conducted to find a way to incorporate GO homogeneously into PMMA to form GO/PMMA composite and confirm that this formulation has no adverse effect on biocompatibility. Nano GO was selected for its documental highly physical and mechanical properties[1].The max loading GO was 1% to avoid aggregation during mixing with resin in higher concentrations.[15]

The inhomogeneous mix of mixing protocol A was attributed to high aggregation tendency of GO in powder form[16]. In mixing protocol B, sonication was done for 64 minutes in intervals reciprocating between sonication and rest to prevent over heating which might induce MMA polymerization. Longer sonication period was avoided because it can significantly introduce defect which undermined the properties of GO[17]. In the mixing protocol C, deionized water was used as dispersion media for GO, then the dispersion was mixed to the PMMA powder and dried. This protocol resulted in the most homogenous mix. This might be explained by the higher polarity of the water and presence of epoxide, hydroxyl, carbonyl, and carboxylic functional groups on surfaces and edges of GO nanoparticles [1,17,18]

According to ANSI/ADA specification no.41, all groups tested for rabbit hemolysis test considered non hemolytic as their results were below 5%. High mean of percent of hemolysis for 1% GO dispersion may be attributed to interaction between the GO and RBC. This finding was in agreement with the previous studies[18-20] and could be explained by many explanations. The first explanation was based on chemical interaction of GO with proteins presence in the blood via charged surface of GO. The second explanation was based on generation of reactive oxygen species (ROS) by GO which induced oxidative stress disrupt the cell membrane [18-20]. The third explanation was based on physical action of sharp GO edges which can cut through the cell membrane[21]. Increasing the percent of hemolysis by increasing the GO concentration in GO/PMMA composite could be explained by increasing the amount of unreacted residual monomer (MMA) by increasing the GO concentration in GO/PMMA composite based on Paz et.al 2017[9] finding. The MMA monomer may cause RBCs to become fragile, and may cause RBC damage [22] and enhanced ROS formation.[23]

Conclusions

This study focused on producing different concentrations of a homogenous GO/PMMA composite and evaluated this composite for biocompatibility. The following findings were concluded from this study; first mixing of GO water dispersion to PMMA powder produces a homogenous distribution of the nanoparticles in the final polymer matrix. Second, GO/PMMA composite in concentrations of 0.05%.0.1%. 0.15 and 1% are biocompatible and can be used in dental and medical applications.

Ethical Clearance: Taken from Faculty of Dentistry, Minia University.

Source of Funding: Self

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Manipulative Movement Based on Information Technology Games for School Children Aged 10-12 Years

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Abstract

Manipulative movements are a series of movements that involve members of the body as a form of action to control an object using energy so that they can engage in movement activities that have a target or goal. Games are movement activities that are loved by all groups of children. Which involves feeling happy, carefree or happy. Information technology is a set of hardware and software that is important in improving the quality of information quickly and with quality. Therefore it is very good and effective if the development of information technology is implemented in the world of sports, one of which is in the form of games for schoolchildren aged 10-12 years so as to facilitate the stages of the learning process in carrying out a variety of good and correct basic motion activities. The purpose of this study is to determine the basic manipulative movement skills in games and the effectiveness of available information technology. This research method uses Borg & Gall research and development with qualitative and quantitative approaches for One-Group Pretest-Posttest Design. So the results obtained through Information Technology in the game will be able to improve basic movement skills that are good and right. It was concluded that the model developed in an information technology-based game can enhance symmetrical manipulation of multilateral basic movements, good and right, especially at the age of 10-12 years and the formation of emotional maturity, a sense of togetherness and effective communication among others and efficiently.

Keywords: *Manipulative Basic Motion Skills, Games, Information Technology.*

Introduction

Learning motion skills is one part of physical education learning in schools aimed to achieve learning goals so that children have adequate movement skills and the ability of movement as a provision in their daily lives[1]. Physical education is an integral part of the education system as a whole. Education as a process of human development in lifetime[2], has a very important role by which it provides opportunity to students to be directly involved in various learning experiences through physical activity. Remembering the importance of motion patterns that form the basis of a movement in student education, various movements which are more attractive and encouraging students need to be developed. Then, the advancement of information technology in all aspects can be utilized to develop education[3]. The basic movement is a level of quality mastery in carrying out body movements as the foundation of a movement process which involves coordinating several body parts or all parts of the body to function properly[4,5]. The degree of coordination of the body parts needed to carry out movements is relatively high. To reach a basic level of motion, it takes a learning process and practice for a certain period of time. As a teacher or educator of physical education and health, they should understand and mastery science both in the form of theory, concepts, and principles from the scientific foundation to carry out

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scientific tasks especially with regard to basic motion[6]. The benefits of motion skills are to: (1) the development of motion for children's health in increasing muscle tone, strengthening bones, maintaining healthy blood pressure, increasing heart performance, introducing healthy lifestyle[7] (2) development of motion in children's motor growth; increase muscle strength, flexibility, body coordination, balance, increase body awareness, develop more complex movements such as running, jumping, throwing (3) cognitive development of children, increasing brain connections, stimulating the ability to spend, improving memory and concentration, increasing creativity and ability to overcome problems, improve abstract thinking (4) developments in children's social abilities; encourage cooperation, establish friendships, enhance learning consequences of behavior. (5) development of children's emotions; build self-confidence, overcome depression and anxiety, improve discipline and self-control, reduce aggressive habits and be able to express feelings well[8].

Through playing activities, it is appropriate to develop basic children's movement skills in elementary school, because basically children's world are to play. Games are one type of activity that is very popular to children[9]. The game provides greater pleasure, according to Patty (2008) there are six types of games, namely: (1) introductory games, (2) individual games, (3) team games, (4) games at party ceremonies, (5) in-game water, (6) scout games.

Therefore, in learning activities, it is not surprising that there are some students who do not participate in learning for a number of reasons as: bored, tired, don't like learning material. It turns out that elementary school students experience obstacles or difficulties, because in childhood locomotor motion abilities development.

Literature Review: The development research is an attempt to develop an effective product in schools[10]. This model is one of the most popular models of education research and development which explains educational research and development [11] is a the process used to develop and validate educational production[12]. Then, the reasons of researchers in closing the model from [13]are as follows: able to overcome real needs through developing solutions to a problem while producing knowledge that can be used in the future and able to produce a product model that has a high validation value because through a series of field trials and validated by experts;[14]. Based on the results of research (Wahyuningtias Puspitorini, James Tangkudung, 2017) similar research results: Through water games in Learning basic motion skills for Children 5-6 years

proven to improve basic movement skills and help build confidence and courage. Followed by other research results, (Hidayat, 2017) with the similarity of research results: an activity in a game can improve the basic locomotor, non-motomotor and manipulative motion techniques. Strengthened from the results of the study (Aji Zaenal Mutaqin, Sufyar Mudjianto, 2017) with the similarity of research results: through the game like games can improve the basic motion patterns in throwing the ball.

Methodology/Materials

This research methodology stage uses development research.

Results and Findings:

Table 1. Preliminary Research Results to Sports Teachers

No	Schools	Grade	Score	Completeness (%)	Classification
1	School A	4	12	80	Good
2	School B	5	10	67	Enough
3	School C	6	10	67	Enough
4	School D	4	11	73	Enough
5	School E	5	10	67	Enough
6	School F	6	9	60	Less
7	School G	6	12	80	Good
8	School H	4	11	73	Enough
9	School I	5	11	73	Enough
10	School J	4	10	67	Enough

Total	**49**	**106**	**706,63**	
Average	4,9	10,6	70,663	Enough
Min	4	9		
Max	6	12		
Very Good	0			
Good	2			
Enough	7			
Less	1			
Very Less	0			

From the results of the analysis as a preliminary study conducted that: the minimum value obtained is 9 while for a maximum value of 12 so the total number of each school with an average value of 70,663% is categorized enough.

Table 2. Results of Analysis of Needs for Students During Learning Physical Education

No	**Teachers**	**Grade**	**Score**	**Completeness (%)**	**Classification**
1	A1	4	264	80,00	Good
2	A2	5	199	60,30	Enough
3	A3	6	217	65,75	Enough
4	A4	4	243	73,63	Good
5	A5	5	201	60,90	Enough
6	A6	6	135	40,90	Very Less
7	A7	6	242	73,33	Good
8	A8	4	177	53,63	Less
9	A9	5	199	60,30	Enough
10	A10	4	155	46,96	Very Less

Total	**49**	**2769**	**709,95**	
Average	4,9	276,9	71,00	Enough
Min	4	237		
Max	6	312		
Very Good	0			
Good	2			
Enough	7			
Less	1			
Very Less	0			

From the results of preliminary data analysis to the 10 teachers above, it can be concluded that the minimum score obtained is 237, while for a maximum score of 312, the total number of each school with an average score of 71% is categorized as sufficient.

Table 3. Pretest and Post Test Descriptive Statistics Analysis

Manipulative Statistics							
		Pre Test					Different
		Throw And Catch		Different	Up Down From Chair		
		Experimental Group	Control Group		Experimental Group	Control Group	
N	Valid	22	22	0	22	22	0
	Missing	0	0	0	0	0	0
Mean		22.36	22.32	.04	22.55	21.86	.69
Median		22.00	22.50	.50	23.00	22.00	1
Std. Deviation		.902	1.323	.421	1.101	1.207	.106
Range		4	5	1	5	5	0
Minimum		21	20	1	20	20	0
Maximum		25	25	0	25	25	0
Sum		492	496	4	491	481	10
Manipulative Statistics							
		Posttest					Different
		Throw And Catch		Different	Up Down From Chair		
		Experimental Group	Control Group		Experimental Group	Control Group	
N	Valid	22	22	0	22	22	0
	Missing	0	0	0	0	0	0
Mean		23.91	23.36	.055	23.91	23.14	.47
Median		24.00	24.00	0	24.00	23.00	1
Std. Deviation		1.342	1.177	.165	1.342	.990	.352
Range		6	5	1	6	4	2
Minimum		20	20	0	20	21	1
Maximum		26	25	1	26	25	1
Sum		526	514	12	526	509	17

Based on the results of the 22 pretest and posttest samples, it can be interpreted that there are significant differences and values increase.

Based on the results of the 22 pretest and posttest samples, it can be interpreted that there are significant differences and increases in value after receiving treatment.

Table 4. Score Distribution Frequency of Tennis Ball Throw and Catch (Pretest and post test)

No.	Interval Score	Category	Pretest		Control	
			Absolut Frequency	Relative Frequency (%)	Absolute Frequency	Relative Frequency (%)
1	20.00-21.25	Very good	0	0	0	0.00
2	21.26-22.50	Good	12	54.55	11	50.00
3	22.51-23.75	Moderate	10	45.45	11	50.00
4	23.76-25.00	Less	0	0	0	0.00
	Total		**22**	**100**	**22**	**100**

No.	Interval Score		Posttest		Control	
			Absolut Frequency	Relative Frequency (%)	Absolut Frequency	Relative Frequency (%)
1	20.00-21.25	Very good	1	4.5455	0	0.00
2	21.26-22.50	Good	19	86.364	19	86.364
3	22.51-23.75	Moderate	2	9.0909	3	13.64
4	23.76-25.00	Less	0	0	0	0.00
	Total		**22**	**100**	**22**	**100**

Based on the results of the Distribution of the Frequency of Tennis Ball Throw and Catch that there is a comparison of the results of the Relative Frequency value between pretest and control of 1 person with a good category of 4.55% while for the Moderate category of 4.55%.

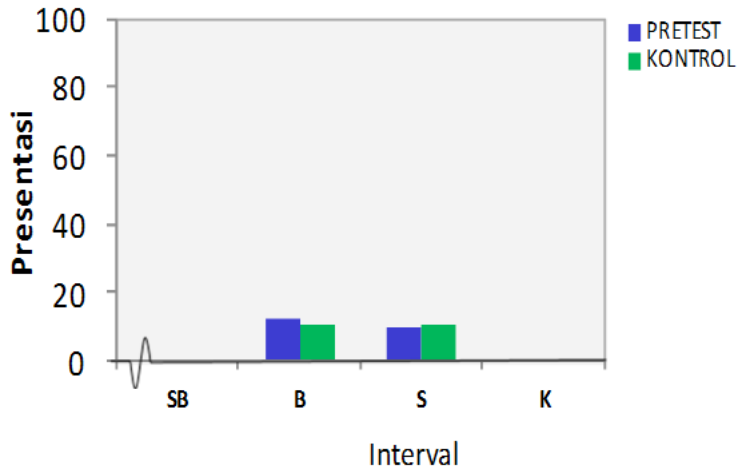

Chart 1. Score Distribution Frequency of Tennis Ball Throw and Catch

Based on the results of the Distribution Frequency Distribution Value of Throwing Tennis Ball that there is a comparison of the results of the Relative Frequency value between the posttest with control of 1 person with a very good category of 4.54% while for the good category of 19 people both from the posttest and control groups or the same, while for Moderate category as much as 1 person is 4.54%.

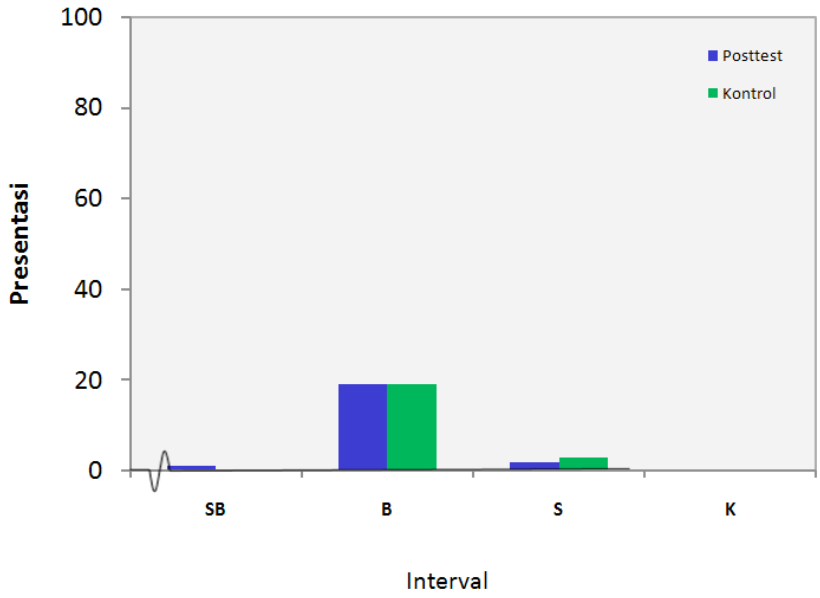

Chart 2. Frequency Distribution Value of Throwing Tennis Ball

Discussion

This effectiveness of the test was the results of a concept that was developed and could be generalized, especially in games for children aged 10-12 years, which could improve multilateral skills of manipulative basic motion. Therefore it is also quite clear that by reinforcing the results of research (Arif Hidayat, 2017) results of the research conducted are able to increase activity, ability and locomotor, non-locomotor and manipulative basic technical skills of students at State Primary School using the game model. While the results of research from (Wahyuningtias Puspitorini, 2017) results in the effectiveness of a fundamentally oriented learning model with games for children 5-6 years.

Conclusion

The results of the concept model developed in a multilateral game based on information technology can support the process of improving the results of basic movements of manipulative harmonious (symmetrical), good and right and the formation of an emotional maturity, sense together and communicate with each other effectively and efficiently.

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The Influence of Job Stressor on Organizational Loyalty and Intention to Quit among Health Care Staff

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Abstract

Job stressor has been taken seriously by the health care organizations because of its effect on employees' behaviours at the workplace. This study was conducted to identify the influence of job stressors on organizational loyalty and intention to quit. This study approach was quantitative with cross-sectional research design. The instruments used were Job Content Questionnaires, Organizational Loyalty Questionnaires, and Intention to Quit Questionnaires. A total of 340 health care staffs in several public hospitals and clinics in Malaysia were involved in the study. Descriptive statistic and multiple regression were used to analyse the data. It was found that job stressors have significant influence on organizational loyalty and intentions to quit. The findings proposed that the management of health care organizations should focus more on managing job stressors in order to increase organizational loyalty and reduce employees' intentions to quit among public health care staffs.

Keywords: *Job demand, job control, organizational loyalty, intention to quit.*

Introduction

Nowadays, the intention to quit and the lack of organizational loyalty are among the critical issues in human resources management[1]. Every large organizations have tendency to lose an average of 20 employees a year[2]. That means most of the employees in various industries and organizations especially in health care sector have a tendency to quit their current job and looking for another job. It is expected to be almost 76 percent of employees in various industries and organization will tend to look for another job and will leave the organization when better job opportunities are available[3].

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Although employees quit their work due to many factors, research evidence indicates that the intention to quit and the lack of loyalty are important indicators for the loss of workers in an organization[4,5]. This problem will cause organizations to spend a lot of money to find,recruit and train new employees. The estimated costs could be double the amount of the employees' annual salary[6]. It will undermine the organization overall performance and productivity, thus contribute to the low morale and motivation among the colleagues[7,8].

The intention to quit refers to the tendency of workers to think and plan to leave the organization for a variety of reasons. Whereas, the organizational loyalty refers to the employees' tendency to stay in an organization. Many studies have been conducted to identify the causes of employees' problematic behavior, which characterized by high intention to quit and low organizational loyalty as it could interfere with overall achievement of an organization.

One of the main reason for organizations to lose their employees is job stressor[9,10]. The United Nations has

labeled job stressor as a "worldwide epidemic" as it has been recognized as one of the major global challenges of the 21st century[11,12,13]. All employees experience stress and there is no way for them to avoid job stressor at workplace[14,15].

Previous researchers studied the association between job stressor and intention to quit[16,17]. However, mostpast studies only focused on general effect of job stress and lack of explanations on the effect of specific job stressor towards the workers' intention to quit especially in the context of public health care staff.

Other than that, there is also limited research on the causal relationship between job stressor and organizational loyalty[18,19]. Despite loyalty can contribute to the organizational achievement, but it is often overlooked by most organizations because they focused more on the quality of service which is expected to influence customer loyalty[20,21].

Therefore, this study conducted to fill the research gapin the context of health care organization as it striving to increase loyalty and reduce intention to quit among employees[22]. There are two objective of this study, first to identify the influence of job stressor on organizational loyalty and second to identify the influence of job stressor on intention to quit.

Literature Review: The concept of organizational loyalty and intention to quit can be understand through the Social Exchange Theory which proposes the element of retention (loyalty) and dissolution (quit) as a process that occurs in the social exchange relationship between employer and employees[23,24]. The theory also explained that the social exchange imbalance could create job stress, which in turn reduces employees' loyalty to the organization. It indicates that there is a connection between job stress, organizational loyalty and intention to quit.

Job stress exists due to the combination of job demands and job control[25]. High job demand with a combination of low job control creates a high stress work environment. Job control refers to the potential and the ability of the employee to control and make decisions about the task they performed[25]. Whereas, job demands refers to the burden such as unexpected tasks, time pressures, physical and psychological workloads[24].

Past researchers support the relationship between job stressor and organizational loyalty in the context of health care staff[26,27,28]. Previous study also support the association between job stressor and intention to quit[29,30,31]. Excessive workload and low authority to make decision will contribute to the increased intention to quit among health care staffs[32,33,34]. Based on the support from previous studies, this study will test four hypotheses.

H1 There is a significant negative influence of job demand on organizational loyalty

H2 There is a significant positive influence of job control on organizational loyalty

H3 There is a significant positive influence of job demand on intention to quit

H4 There is a significant negative influence of job control on intention to quit

Material And Method

The population of this study were public health care staff which consist of trained nurses and medical assistant officers in several public health clinics and hospitals in Malaysia. Previous study showed that employment in the health care sector is among the high stress occupations in Malaysia[34]. In addition, past researchers also often associate health care staff with a high desire to leave the organization[10,36].

The respondents were chosen using simple random sampling technique. The total samples obtained in this study was 340 public health care staffs. Overall, the majority of respondents were nurses (76%), female (66%), between 20 and 29 years old (49%) and have less than 5 years working tenure (42%). This study uses cross-sectional research design with quantitative data approach.

The Job Content Questionnaire used in this study to measure job stressor[37]. It has high reliability with Cronbach's alpha value of 0.71 to 0.86. Furthermore, the Organizational Loyalty Questionnaire used to measure organizational loyalty[38]. The 7 items questionnaire have high reliability with Cronbach's alpha of 0.84.

As for the intention to quit, this study used 3 items from Intention to Quit Questionnaire[39]. The instrument have high reliability with Cronbach alpha 0.92. All of the questionnaires were measured using 5 point Likert scales ranging from 1 "strongly disagree" to 5 "strongly agree". Simple linear regression analysis was conducted to identify the influence of job stressor on organizational loyalty and intention to quit.

Findings: This study found that there is a significant influence of job stressors on organizational loyalty. Both job stressors explain 14% variance of organizational loyalty among health care staffs. Specifically, the findings showed that job demands negatively influence organizational loyalty. On the contrary, job control was found to be positively influence organizational loyalty. Therefore, the findings of this study accept hypotheses H1 and H2.

This study also found that job stressors were significantly influence the intention to quit. Both job stressors explain 13% variance of intention to quit among health care staffs. Specifically, it was found that job demand influence the intention to quit positively, whereas job control predicts the desire to quit negatively, thus accepting hypothesis H3 and H4 in this study.

Table 1: Regression Analysis

Model	Organizational Loyalty		Intention to Quit	
	β	t	β	t
Job Demand	-0.29**	-3.69	0.75**	5.89
Job Control	0.42**	7.01	-0.51**	-5.21
R	0.37		0.37	
R^2	0.14		0.13	
F	27.21**		25.90**	

**Significant at the level of two-tail($p< 0.01$)

Discussion

This could be one of a very few study that examine the causal relationship between job stressors and organizational loyalty especially among health care staffs in Malaysia. Based on the results of regression analysis, this study found that the presence of job stressors in the workplace can cause changes in the workers' intention to stay in the health care organization. The findings of this study was consistent with the findings of previous research[,40].

Specifically, this study shows that higher job demands will contribute to a lower organizational loyalty. The finding is in line with previous study which shows the negative association between job demands and organizational loyalty[42,43]. Health care staffs who are often overworked and overwhelmed with task will tend to leave the organization.

On the contrary, this study found that job control will increase the organizational loyalty. The results support previous study which found that job control positively related with organizational loyalty[26,28]. Hence, when a health care staff is given freedom to make decisions about his appointed tasks, the staff tends to help organizations to succeed and continue to stay in the organization in the future. This is probably because the staff felt that the authority given to them reflects the employers' trust in them, so they tend to be more committed in their work.

Other than organizational loyalty, this study also found that job stressors influence the intention to quit among health care staffs. Specifically, this study found that the increase in job demand will increase the employees' intention to quit. This finding supports previous studies that positively associated job demands with intention to quit among health care staffs[10,31,36].

The findings also showed that the health care staffs who often work hard to complete their task within a limited time will tend to think of quitting their current job. Basically, high job demands can increase employees' emotional, mental and physical fatigue. Therefore, to avoid being constantly confronted with the situation, the employees tend to think about leaving the organization in the future.

Furthermore, this study found that employees who have higher job control, will less likely to quit their job. This finding supported previous studies that found significant association between job control and intention to quit[10,31,34]. When employees are given less freedom to make decisions regarding their assigned task, they will feel dissatisfied with their work and as a result, they tend to think about quitting their current job. It is because individuals' perceptions of their ability to manage and controlling their work is what predicts their actions to quit.

Conclusion

This study provide the additional value in literature by expanding the causal relationship between job stressor, organizational loyalty and intention to quit in the context of health care staffs. However, it would be beneficial for future researcher to expand the research among health care staffs in the private sector too. Job demand and job control was found to be significantly associated with the employees' workplace behaviour. The findings of this study revealed that managing the job stressor would be beneficial to prevent the loss of employees in the health care organization.

Conflict of Interest: Nil

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Emotional Intelligence and Conflict Management Style among Staff in a Bank

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Abstract

The purpose of this research is to identify the relationship between emotional intelligence and conflict management style among staff at a Bank Headquarters in Kuala Lumpur. A total of 75 staff were involved in this research. The questionnaires distributed in this research were adapted from Wong and Law EI Scale (WLEIS) (2002) based on Mayer, Salovey and Caruso's EI Model (2004) and Rahim's Organizational Conflict Inventory-II (ROCI-II) (1983) based on Rahim's Organisational Conflict Model (2011). The relationship between EI and CMS was identified based on the Pearson's Correlation analysis. It was found that there are significant influences between EI and integrating, obliging, dominating and compromising style while EI does not show any significant influence on avoiding style. The findings also showed that the staffs have high EI based on the mean score. Implications of these research suggested that organisation should be more aware of the employees' potential and abilities as well as their style of handling conflict in order to create a positive work environment. In addition, these research findings could add up to the literature of emotional competence and conflict management field.

Keywords: *Emotional Intelligence, Conflict Management System.*

Introduction

Emotional intelligence (EI) is one of the important aspects or traits of an individual because it could promote stability in creating better relationship between one another by projecting trust, sensitivity and understanding towards their emotions and feelings. The concept of EI in the organisation is when excellent employees are able to utilise their EI competencies for the satisfaction, commitment and outstanding performance in the organisation[1].

The usage ofEI competency could aid conflicts that arise in the organisation. Conflict is inevitable in our context of living. Conflict can be defined as the internal or external discord between individuals or groups that results from the differences in attitudes, ideas, values and feelings[2]. Likewise, there are two distinct ways to handle conflict[3]. Firstly, respond to it in a productive manner where the employees develop and learn from the disagreements while secondly is the employees demonstrate negative response towards the conflict but it will lead to further difficulty and tension.

Positive linkage or relationship between EI and CMS can lead to successful interaction and effective performance[4]. Those who possess higher EI level will have better capacity in handling conflict in effective way[5]. In fact, EI has high importanceon integrating, compromising and dominating styles because those styles required higher sense of understanding and judgement[6, 7]. Hence, the purpose of this research is to identify the relationship between EI and CMS among staff at XY Bank Headquarters.

Conceptual and Operational Definition: For the purpose of this research, the definition of EI was administered from Mayer, Salovey and Caruso[8] that

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defined EI as the ability to perceive emotions, to access and generate emotions in order to understand emotions and emotional meanings, to assist thought and to reflectively regulate emotions to promote better emotions and thought. Thus, for this research the operational definition was based on the four dimensions ofthe EI theory from Mayer, Salovey and Caruso[8].

Conflict management is the used of effective style or strategies designed to minimize dysfunctions of conflict as a result to enhance effects of constructive conflict for organization effectiveness and learning[10]. There were five dimensions to represent the theory in this research. The dimensions are dominating, obliging, compromising, integrating, and avoiding.

Literature Review: The term EI came into research when Mayer and Salovey[8,12] first introduced it as a type of social intelligence which carries the meaning of the ability to monitor one's own and others' emotions, to discriminate among them, and to use the information to guide one's thinking and action. EI is an important aspects in every organization as human are creatures of emotions, hence, EI capability is well sought after[13].

Meanwhile, conflict management style (CMS) is way to control conflict in appropriate manner; rational, just and effective supported by effective communication, problem solving and negotiation skills[14]. Rahim[15] has constructed a conflict model that comprises of five styles which are dominating, obliging, compromising, integrating and avoiding.

Based on empirical studies, there were linkages between EI and CMS. The selection of CMS is different from one person to another person depending on their EI[16]. According to Schlaerth*et al*.[17] those who possessed higher level of EI tend to be more collaborative and problem-solver when facing the conflict because they could control their emotion to solve the conflict rationally and satisfy both concerns.

Furthermore, Goleman[18] indicates that higher EI leads to positive behaviours in handling conflict such as open to discussion, convey convincing messages and keeping calm. When they are able to channel the positive behaviour in the organising, it will be easier from them to handle the conflict effectively. They are willing to exchange information with each other and sit down together to discuss for desirable solution. Thus, integrating and compromising styles are frequently used to resolve conflict because it could harmonise the situation.

On top of that, higher EI person will usually avoid the usage of avoidance and dominating style because they are less inclined to cause grievance to other party involved in the conflict. They will not supress and disregard the situation because it will not resolve the conflict and benefit any party[19]. Person with higher EI will have higher sensitivity and deep empathic that made them willing to discuss and think for possible solution to solve the conflict[16].

Next, those who possessed low level of EI have the tendency to take charge or steer away from the conflict[20] because either they are insensitive or incapable. People tend to take charge or dominate in handling the conflict because they have low concern on others[21] and wanted to win by utilizing the concept of win-lose resolution. Lower in EI tend to make people to be aggressive when engaging in conflict[22]. They will ignore the relationship because they are insensitive to others feeling and emotion[14]. Unlike avoidance, people with lower EI will steer away from the conflict because they are incapable to resolve it or they believed that the conflict it not an important matter to be considered[23].

Methodology

Research Design: This research used a non-experimental design and the quantitative method. This method helped to measure the level of EI and CMS. The data was analysed based on descriptive and inferential statistics.

Population and Sampling: The sampling method used was convenience sampling as it was selected based on accessible population due to the permission given by the authority of XY Bank Headquarters which the research can be conducted towards the 85 staff in Human Capital Department only. However, the response rate was only 88.2% with only 75 staff responded to the questionnaire.

Data Collection Method: The research instruments were based on questionnaire derived from Wong and Law; WLEIS[9] for EI and Rahim[11] ROCI-II for CMS. The questionnaires were distributed to the population of 85 staff and only 75 responses were managed to be collected back to analyse.

Findings:

Level of Emotional Intelligence: From Table 1, it can be concluded that the dimensions are at high level except for perceiving and expressing emotion which falls at moderate level (M=3.66). The overall EI among XY Bank staff is at high level of 3.81.

Table 1: Level of EI Dimensions

Dimension	Item	Mean (N=75)	Level
Understanding Emotions	4	4.00	High
Perceiving and Expressing Emotions	4	3.66	Moderate
Facilitating Emotion in Thought	4	3.87	High
Managing Emotions	4	3.71	High
Total		**3.81**	**High**

Style of Conflict Management: Table 2 shows that the staffs mostly used integrating style (M=3.91). The overall mean score for CMS is at moderate level (M=3.52).

Table 2: Level of Conflict Management Styles

Dimension	Item	Mean (N=75)	Level
Integrating	7	3.91	High
Obliging	6	3.46	Moderate
Dominating	5	3.10	Moderate
Avoiding	6	3.31	Moderate
Compromising	4	3.74	High
Total		**3.52**	**Moderate**

Relationship of Emotional Intelligence and Conflict Management Style: From the findings it can be concluded that EI and CMS have a positive moderate relationship (r=0.500*). However, for the overall EI score does not show any significant influence on the selection of avoiding style (r=0.49, p>0.05). Table 3 depicts that all of EI dimensions has a relationship (p<0.05) with integrating and compromising style.

Table 3: Pearson's Correlation Analysis of EI and CMS

Emotional Intelligence	Conflict Management Style				
	IG	OB	DM	AV	CM
Understanding Emotions	.534*	.176	.070	-.010	.510*
Perceiving and Expressing Emotions	.273*	.317*	.153	.148	.254*
Facilitating Emotion in Thought	.438*	.161	.205	-.023	.400*
Managing Emotions	.522*	.259*	.378*	.003	.478*
Overall	.620*	.335*	.304*	.049	.574*

* Correlation is significant at 0.05 level (2-tailed).
Note: IG = Integrating, OB = Obliging, DM = Dominating, AV = Avoiding, CO = Compromising, N = 75, *p<.0.05

Discussion and Recommendation

The results show that the overall EI has moderate positive relationship towards the overall CMS. Based on the dimensions of both variables, all of EI dimensions have emerged to be significant influenced on the selection of integrating and compromising style among the staff. Firstly, understanding emotions has shown relationship with integrating and compromising style whereas obliging, dominating and avoiding style have no significant towards the dimension. This indicated that, the staff tends not to oblige, dominate or avoid the conflict because those who have high understanding emotions would know why they act in certain ways and have a good sense of why they have certain feelings to satisfy their own concerns and ensure smooth discussion. Individuals with high EI are more inclined to listen others viewpoints to seek for alternatives that will not inflict any harm to other party and to avoid wrong decision that will affect them[24].

The emotional dimension of perceiving and expressing emotions only shows relationship with integrating, obliging and compromising style. It has no significant with dominating and avoiding style. The highest relationship of perceiving and expressing emotions is portrayed from obliging style. Good in perceiving and expressing emotions indicates that the person has good social skill and high empathy which makes them easier to communicate and share feedbacks with others[23]. Therefore, it shows that the staffs have good social skill, which encourage them to share their concerns and try to understand their colleagues. At the same time, they will not dominate and avoid the situation because they are sensitive to others' concern and try to fulfil their concerns too. A research had also found that, individuals with good ability to understand other's emotions would choose integrating and compromising style because they will deal with others' opinion and acknowledge their rights to achieve a win-win solution[24].

Next, the finding revealed that dimension of facilitating emotion in thought has relationship with integrating and compromising style which shows that the staff have high ability in facilitating emotion in thought that because they have the motivation for moving and directing themselves towards reaching their goals. So, obliging, dominating and avoiding style would not be a contributor for them to move forward but as a stumbling block because those styles are about winning or letting go their aim in which is not ideal to achieve their goal and to keep the relationship steady. Shamoradi et al.[25]found that self-motivation has a relationship with compromising but not with integrating style. This is probably because of the cultural aspect, in which,the Iranians are inclined in a give and take situation and willing to sacrifice their interests to sooth other party because they would not let dispute among colleagues preventing them from moving forward.

Managing emotions shows the most significant relationship with most of CMS except for avoiding style. The strongest relationship pointed to the integrating style and it is the only dimension that has significant with the dominating style. From the findings, it can be concluded that the staff is capable of controlling their emotions, anger and able to handle conflict rationally. This is probably because when facing with a conflict, the situation could be tense and those who are able to control their temper and think rationally throughout the discussion could win it as people are more inclined to listen to those who can use logic and provide evidence in solving conflict. This can be supported from the research by Ashkan[26] who claimed that people usually feel injustice during conflict and if they let it consume their feeling then it will distract them from resolving the conflict.

It has found that EI has positive relationship with integrating style and compromising style. This shows that the staffsare highly collaborative. They are ready to share and communicate with each other to resolve conflict in the most desirable way for all parties. They looked into the concerns of others when finding for the solutions. These results are in accordance with prior research which revealed that high EI person is expected to use integrating and compromising style in managing conflict[6,7,17]. They utilised the concept of win-win situation by taking others' concerns into account when constructing solutions. Other than that, they are able to control and facilitate their emotion when communicate with other party and remain rational throughout the process.

The findings shown thatEI has a relationship with dominating style which indicated that the staffs were less likely to use dominating style because higher EI person would not control and disregard other parties' opinion because they would discuss the matter in constructive way to achieve acceptable solutions between both parties. Highly emotional competence person have higher sensitivity and deep empathic towards others that made them willing to sit and work together in order to find possible solution[16]. Moreover, high EI person would not suppress others because it would not bring any advantage to the parties involved[19].

Furthermore, it can be seen that the staff have high EI, hence, contributes to good CMS which they commonly use integrating and compromising style in handling conflict. These styles are unlikely to cause further disputes between the staff because they tend to be sensitive and considerate of others' opinion in the discussion. They are also willing to share information with their peers in order to reach mutually acceptable solutions. Hence, the relationship between EI and CMS is positively significant from this research

Recommendations: As recommendations, future researcher can replicate this research but by extending it to a different sector with different and more diverse sampling size to have more accurate results. Lastly, future research can administer qualitative research method.

Conclusion

The findings show a positive relationship between EI and CMS among the staff. The EI shows significant relationship with integrating, compromising, obliging and dominating style. Hence, the findings provide some contribution to the body of knowledge related to EI and CMS.

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Trend on Drink Drive and Road Accident Across Asian Region: A Review Study

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Abstract

Road accident is a distressing issue that has been faced by all countries worldwide. Asia contributed more than one fourth of the total of road accident rates every year. One of the leading road accident factors that have been reported by most scholars is the drink drive problem. Therefore, this review was conducted with an aim to systematically study the trend on the drink drive and road accident. Searches were performed in Wiley Online Library, Emerald, Scopus, Science Direct and Web of Science. A total of 2462 findings have been yielded and after the screening and reviewing process, only 23 studies were included in this review. In overall, most of the included studies were published in Accident Analysis and Prevention journal within the years of 2000 onwards. The scholars mostly have undertaken their studies using the case series research design and using the accident data cases as their sample. Finally, most of the studies were undertaken in China.

Keywords: *Road accident, drink drive, Asian Region, systematic review.*

Introduction

Road accidents contribute most of the global fatalities statistics in the world with approximately 1.35 million deaths every year. Further report by World Health Organization (WHO) reveals that about 20 to 50 million victims suffer from disabilities and other non – fatal injuries due to the road accident[1]. Statistic shown that more than 90% of the accident occurrences globally happened in the low and middle income countries, which indicates that the level of socioeconomic d plays a role in influencing the road accident statistics. Less developed countries especially the African region recorded among the highest death rates due to the road traffic injuries[1].

Asian region also been reported facing a critical road accident problem with Thailand tops the fatalities statistics followed by Malaysia and Vietnam. Meanwhile, Singapore and Japan reported the lowest road fatalities[2]. There are three main factors that lead toward the occurrence of road accident which are human factors, technical factors and environmental factors. Among these, human factors lead the most of the accident occurrences with approximately 90%, whereas the remaining is due to the technical factors and environmental factors[3,4]. Nevertheless, in certain country like Malaysia, it has been reported that 80% of the road accident happened due to the human factors contradict to other countries worldwide[5].

The most common human factors that significantly lead toward the occurrences of road accident are the drivers' intentional behaviour of breaking the traffic rules and regulation or also known as the traffic violation behaviour. Literatures reported that some of the traffic violation behaviour that commonly been committed by drivers are drink drive, illegal use of mobile phone while driving, tailgating or close following, run over red light, dangerous overtake, speeding, fail to turn the turning indicator and even driving during drowsiness[6,7]. Among these violation behaviour, drink drive is been reported

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as one of the leading accident causation[6,7]. According to WHO, alcohol has cause one in every 20 deaths around the world and responsible for three million deaths every year[8]. Due to this alarming fact, this paper is been constructed to systematically review the trend of the drink drive and road accident which specially been conducted in the Asian region.

Material and Method

A search has been conducted in five academic databases such as Wiley Online Library, Emerald, Scopus, Science Direct and Web of Science. The research timespan has been set within the year of 1951 until December 2018. The search also has been limit to research papers published in peer-reviewed journal as well as written in English language only. The researchers has outlined several keywords such as "determinant", "factor", "cause", "road accident" and "traffic crash" in order to undertake the searching process. Apart from that, several Boolean Operators such as "OR" and "AND" also been used in order to assist the searching process. Moreover, the researchers also outlined several inclusion and exclusion criteria which used as the guideline in selecting the most appropriate research papers to be included in this review study. Finally, upon the completion of the search process, the researchers export all the related findings into the EndNote X7 for further reviewing process. The information on the inclusion and exclusion criteria is as below:

Inclusion Criteria:

1. Type of study: Any type of cross-sectional study either survey or interview or observation, case series and case control study.
2. Participant: All types of participant or sample (all vehicle drivers or rides) who either already involved in a road accident or not as well as accident data from authorities.
3. Outcomes: Any studies that investigate on the drink drive and road accident. The outcome of this review were explained in term of the year of studies been published, type of journal the studies been published, country or location were the studies been undertaken (specifically in Asian region only), participant or research sample used the studies and type of study design.

Exclusion Criteria:

1. Type of study: Any studies which categorised as review study, meta-analysis study, governmental report or any non-profit organization report, student dissertation or thesis.
2. Research focus: Any studies that investigate on the other factors that lead toward road accident either other human factors, technical factors and environmental factors.

Results

In overall, a total of 2462 findings were gathered from the five databases during the search process. Details information regarding the gathered findings was tabulated in Table 1. After all the findings were exported into EndNote X7, the researchers undertook the first screening and reviewing process to detect duplicate. In this process, the EndNote X7 filtered all the findings and deletes any duplication findings which found from all databases. A total of 271 duplicate articles were removed during this process. Next, the remaining 2191 findings have undergone the title screening process. During this process, the reviewers delete another 1344 unrelated title. After that, the reviewers read each abstract of the remaining 847 related title and 579 unrelated abstracts were deleted. Then, the reviewers retrieved the full text for the remaining 268 related abstracts through the EndNote X7 function. For certain abstracts that cannot be retrieved by the EndNote X7, the reviewers formally requested the full texts from the original authors either through their Research Gate account or their personal e-mail address. After all the full texts were gathered, the reviewers finally read all the full texts and only select papers which fulfil the inclusion and exclusion criteria. As a result, only 23 papers were included in this review study. Detail information on the overall screening and reviewing process can be referred to the PRISMA flow diagram as shown in the Figure 1.

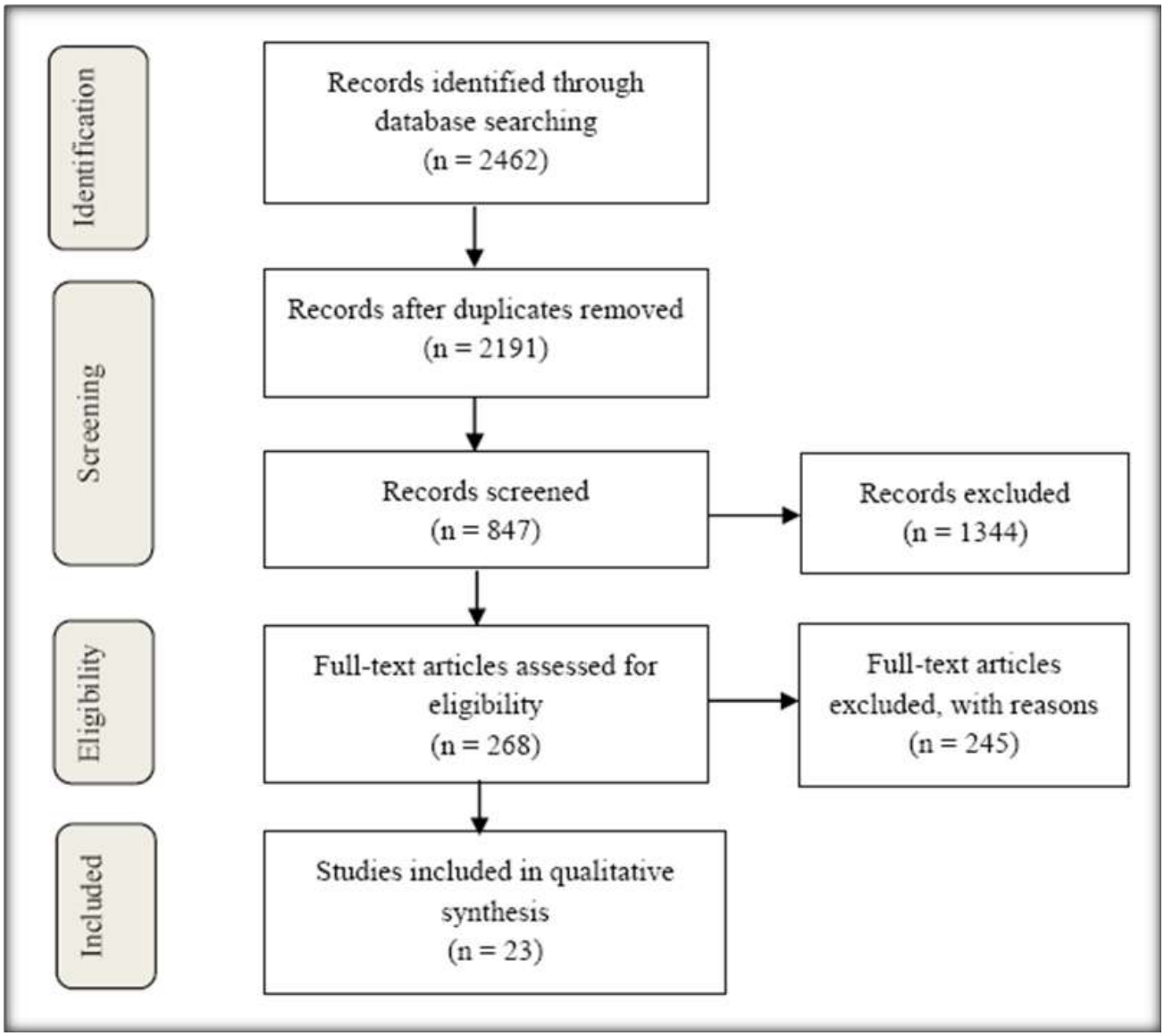

Figure 1. PRISMA flow diagram of the included and excluded studies

Table 1: Search returns based on the academic databases

Database	Timespan	Returns
Wiley Online Library	1973 – 2018	141
Emerald	1951 – 2018	128
Scopus	1990 – 2018	789
ScienceDirect	1993 – 2018	855
Web of Science	1990 – 2018	549

Table 2: Detail on the type of journals and years of publication

Journal	Years										
	2003	2005	2006	2007	2013	2014	2015	2016	2017	2018	Total
Accident Analysis & Prevention	1	1			1	1					4
Journal of Forensic and Legal Medicine					1	1					2
International Journal of Injury Control and Safety Promotion						1		1			2
Journal of Traffic and Transportation Engineering-English Edition									1		1
Journal of Transportation Engineering			1								1
SpringerPlus								1			1
Forensic Science International		1									1
Injury-International Journal of the Care of the Injured								1			1
Transportation Research Part F-Traffic Psychology and Behaviour									1		1
Journal of Safety Research										1	1
Tzu Chi Medical Journal				1							1
Transportation Research Procedia									1		1
Chinese Journal of Traumatology - English Edition							1				1
Chinese Journal of Traumatology									1		1
Planning Malaysia								1			1
Transport						1					1
International Journal of Crashworthiness								1			1
Iranian Journal of Public Health					1						1
Total	**1**	**2**	**1**	**1**	**3**	**4**	**1**	**5**	**4**	**1**	**23**

a. Type of Journals and Years of Publication: All included studies were published in 20 journals. Majority of the studies (n = 8) were published in Accident Analysis and Prevention, followed by four studies were published in PLoS ONE, three studies were published in Journal of Safety Research and two studies were published in ITE Journal (Institute of Transportation Engineers) and American Journal of Public Health respectively. Whereas, the remaining 15 studies were published in International Journal of Epidemiology, Safety Science, Journal of Traffic and Transportation Engineering-English Edition, SpringerPlus, British Medical Journal, New England Journal of Medicine, Tzu Chi Medical Journal, Psychiatry Research, Chinese Journal of Traumatology (English Edition), Procedia Engineering, Journal of Adolescent Health, Canadian Journal of Civil Engineering, Journal of Transport & Health, Planning Malaysia and Acta PolytechnicaHungarica. Meanwhile, regarding on the years of publication, majority of the studies (n = 5) were published in the years of 2011, 2013 and 2017 respectively, followed by four studies were published in the years of 2014 and 2016 respectively.

Next, three studies were published in the year of 2007 and two studies were published in the years of 2015 and 2018 respectively. Finally, one study was published in the years of 2003, 2006, 2010 and 2012 respectively. Overall, the results reveal an increase in publication over time.Detail information on the type of journals and years of publication can be found in Table 1.

b. Research setting: Diagram 1 shows the summary of the list of countries where all the included studies were conducted. In overall, the included studies were undertaken in 10 different countries across the Asian region. Most of the studies (n = 6) were undertaken in China followed by four studies in Turkey. Three studies were undertaken in Taiwan and two studies in India, Iran and Malaysia respectively. Finally, the remaining four studies were undertaken in Hong Kong, Thailand, Vietnam and United Arab Emirate (UAE).

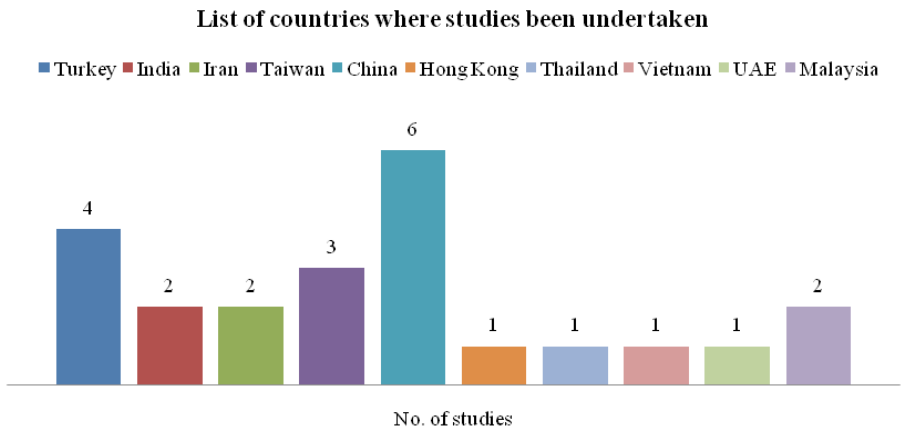

Diagram 1. Detail on list of countries where studies been undertaken

c. Research Participant/Sample: All the included studies were conducted using several type of research sample of participant. Majority of the studies (n = 14) use the sample of accident data cases which gathered from the authorities. Four studies use the sample of actual accident victims followed by two studies that include students/young drivers as participants. Finally, the remaining three studies use the sample of professional and amateur drivers, general drivers (author did not provide the detail) and the combination of various participants such as bus drivers, motorcycle users, bus passengers, bus company manager, traffic policeman and local authorities. Diagram 2 shows the detail information on the research participant/sample.

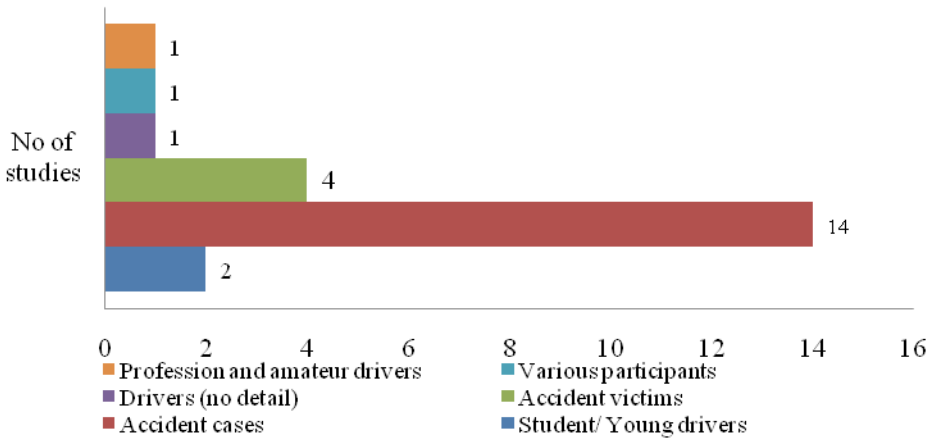

Diagram 2. Detail on research participant/sample

d. Type of Research Design: All 23 included studies applied five different type of research designs with majority of the studies (n = 16) used case series. In the case series study, the information was gathered from the authorities. Four studies were cross sectional studies, which three of them using questionnaire and one study using interview method. Meanwhile, two studies were case control study (data gathered from the accident victims' intoxication result) and finally one study used the in-depth analysis of accident case to collect the data. Detail information on the type of research design can be referred to Diagram 3.

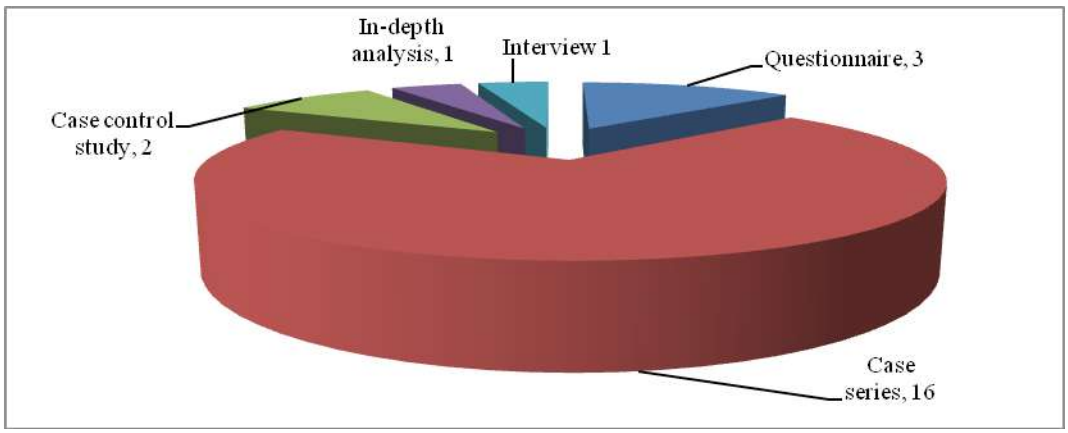

Diagram 3. Detail on type of research design

Conclusion

In overall, there has been an increasing of interest among researchers to explore the drink drive and road accident within the Asian. Majority of the included studies were published in the Accident Analysis and Prevention journal which is one of the high impact factor journals listed under the Scopus and Web of Science databases. Next, it also can be summarized that all included studies on drink drive and road accident in Asian region were been published on 2000 onward although the search process was conducted from the year of 1950 onward. Most of the included studies were published after 2013. Moreover, although there are 50 Asian countries across the region, only 10 countries were reported to undertake the study on drink drive and road accidents with majority of the studies were conducted in China. Finally, in term of the type of research design and research participant/ sample, most of the included studies undertaken their research using the sample of accident data cases which been categorised as the case series research design. This data can be accessed or provided by the authorities or other related bodies.

Based on this review, it can be concluded that drink drive is one of the critical topics as factors leading to road accident. This topic also among the common research area that been studies by scholar not only within the Asian region but also all around the world. Due to this facts, it is suggested to any future researchers who are interested to undertake this study to explore more on this area, not only on the impact of drink drive toward road accident but also looking on the effectiveness of the legal enforcement that been established by the government to curb this issue. Subsequently, from this review, it can be identified that most of the included studies using the research design of case series to summarized the accident leading factors. Thus, it is suggested to the other researchers to use face to face interview because this method will help the researchers to gathered even richer information. The drivers' perception toward road accident issue indeed crucial because they are the one who really know what is the best solution which is applicable to them in order to avoid the incident of road accident. As a result, more comprehensive countermeasure can be outlined when all the related parties involved in resolving this issue.

Conflict of Interest: Nil

Source of Funding: Self source

Ethical Clearance: Done research committee

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Obesity and Job Performance among Teachers in Malaysia

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Abstract

Despite the growing interest of teacher performance in relation to factors such as leadership, work and/or family conflict or stress, studies which linked teacher with overweight or obesity with job performance and productivity are insignificant. Moreover, Malaysia is Southeast Asia's "most obese" nation with an obesity incidence of 17.7% and an overweight of 30%. Data is a review of newspapers and official reports as well as academic journal articles and theses from established databases such as Wiley Online Library, Taylor and Francis, ScienceDirect and ProQuest. The scope is obesity or overweight experiences which may affect performance or productivity at workplace taken from 2010 onwards including the level of non-communicable disease, productivity assessments and annual reports. Study about obesity and its impact towards teacher's performance or productivity is almost none. The impact of obesity on job performance can be seen from its impact on individual, social and economy. The impact towards economy and individuals are discussed with focusing more on Malaysian context. Evidence used in this study come solely from the mentioned resources. Conclusions reached are thus qualified by that limitation. Further studies should be conducted on the exact obesity trends among teachers and the impacts on performance or productivity. More in-depth studies are needed specifically on the definite and diversified factors and the effective ways to tackle this issue among adult especially teachers.

Keywords: *Obesity, overweight, job performance, productivity, teacher.*

Introduction

Study which relate obesity and job performance among teachers are still new especially in Malaysia. Overweight and obesity, usually measured using Body Mass Index (BMI) are defined by World Health Organisation (WHO) as unusual or excessive accumulation of fat posing a health threat[1]. Another indicator used is abdominal obesity (AO) measured in the waist circumference (WC) which appears to be more closely related to a high morbidity and death, as well as an increase in the risk of cardiovascular (CVD) and diabetes mellitus compared to BMI[2].

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National Health and Morbidity Surveys (NHMS) findings from 1996-2015 in Malaysia show noticeable increases of average BMI and WC among Malaysian adults and children[3]. All ethnic groups displayed an upward trends of obesity with obese Indians (43.5 %), married adults (33.8 %) and those with only secondary education (32.1 %). The most significant increases in average BMI and AO were observed in women and people in the rural population[3]. The highest gain in overweight incidence was also seen in males and the elderly[4,5].

For job performance, there are studies about the level and its association with some determining factors like leadership style, motivation, job stress, emotional intelligence, workforce diversity, work environment, teacher characteristics, personality traits and work passion[6,7,8,9,10,11]. Teacher plays a major role as the people who cultivate and educate the future generation of a nation by their great influence. Beside mothers,

teacher's BMI, education level as well as teacher's satisfaction with children's weight have significant impact on children weight and health[12]. A study also shows that teacher's body image has influence the children[13]. Thus, the performance of teachers is linked to the growth of students[14,15]. This scenario is quite alarming as recent research shows 19.9% or one in five children ages 7-12 in Malaysia suffer from overweight and obesity[16].

Level And Condition: The Malaysian job performance rating has declined considerably from 2015 to 2017, according to the Global Competitiveness Report (GCR) 2015-201817,18,19. As below, Table 1 shows that Malaysia is currently placed at 25th position out of 140 countries 19. In 2016, however, it was listed 18th 17. It shows that employee efficiency in Malaysia, including teachers, has decreased.

Table 1: Malaysia's Competitiveness Rankings

Year	Performance Score	Ranking
2015	5.23	20th
2016	5.16	18th
2017	5.17	26th
2018	74.4 (new format: Global Competitiveness Index 4.0)	25th

Malaysia currently has about 32 million people and around 1,7 million are in public service which made them the largest public service number in South East Asia. Of the groups, 39 % work in the General Federal Public Service, 14 % work in the health sector and nearly one third work in the education services alone[20]. The total wage deployment for public service people is around 11.4 % of the overall salary spending in Malaysia[20]. Although Malaysia's Competitiveness Ranking is getting lower, the number of teachers in Malaysia's education sector is increasing every year. It brings negative impact towards the education system and some correction measures are needed to tackle the issue. Table 2 shows the total number of teachers in Malaysia from year 2014 until 2018.

Table 2: Total Number of Teacher in Malaysia

Year	Total Number of Teacher in Malaysia
2014	420854
2015	421379
2016	421828
2017	422505
2018	423566

The findings from NHMS 2015 indicate that the government's administrative officials had a 35-37% likelihood of overweight while obesity stood at 43%[21]. If by taking the same percentage of 43% for obesity rates, the prevalence of teachers who might be fallen into the overweight and obese group are estimated around 181000. The findings put the administration in a disgraceful state, since the number of Malaysia overweight and obese people were not reduced[22]. This scenario is a clear signal that obesity crisis, which has already overwhelmed our health care services, will also cripple our economy and the growth of the younger generations if no decisive action taken[23].

Impacts on Economy:

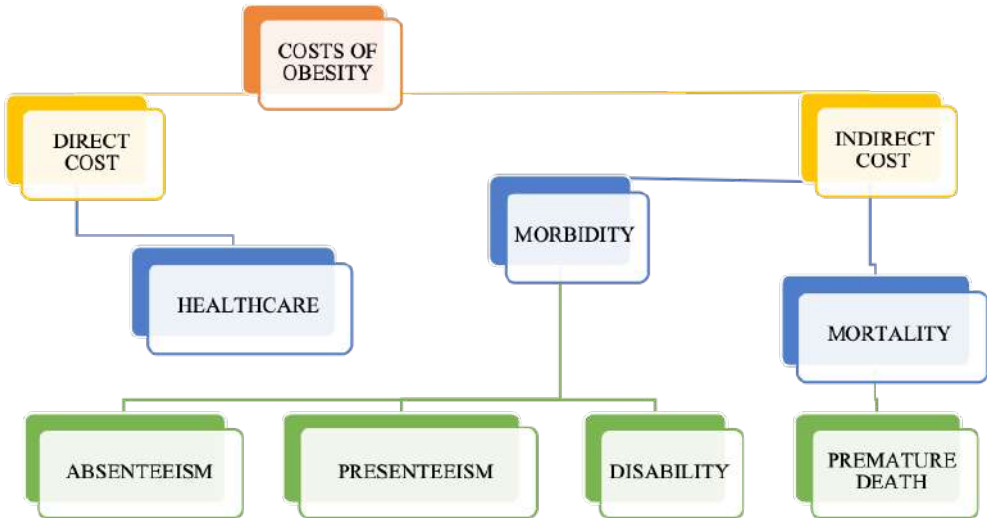

Figure 1: Economic cost of obesity framework

Figure 1 above shows the cost of obesity from an economic point of view. It can be divided into two categories; direct and indirect. The Economist Intelligence Unit[24] reports that direct costs are associated with medical expenditure from diagnosis, therapy and also from prevention on obesity associated illnesses. In Malaysia, Total Expenditure on Health (TEH) in year 2013 has been recorded as RM 44.748 million, which is equal to 4.53% of Gross Domestic Product (GDP)[25]. The TEH is increasing each year, with RM 53.110 million registered in 2015 and RM 57.361 million registered in 2017[25]. Despite health expenditure is being highly subsidized, the spending remained largely expended on government and public needs[26].

Absenteeism is defined as time off from work because of obesity and overweight. Due to the ease of estimation, absenteeism was likely the most frequent indirect cost measurement. In Malaysia, the Malaysian Employers Federation (MEF) Medical Benefits & Man-Days Loss (Including Absenteeism) Survey 2015 has projected that for 6.6 million workforce, companies need to pay out RM1.18billion in medical costs for hospitalized employees and RM46.3million in non-hospitalization medical costs[27].

Presenteeism at workplace or showing up for work during sickness, now appears more common than absenteeism. It may constitute physical and mental absence[28]. Presenteeism is present in most fields, but is particularly high in education[29]. Presenteeism is frequently associated with severe losses in productivity and has a number of symptoms such as migraines, allergies, sinus problems, asthma, acid reflux disease, dermatitis, anxiety and depression[29]. Many studies have shown that presenteeism contributes to depersonalisation and fatigue[30].

In terms of disability, the decreased executive role was linked to obesity but not overweight in some researches[31,32]. Further, it is shown that some facial emotional decoding problems occur in overweight and obese kids in comparison to normal weight kids[33]. Low conscientiousness have also been associated with higher BMI[34]. Three cross-sectional studies confirmed favourable obesity connection with falls and older adults[35,36,37]. Furthermore, a study suggest that obesity, even if metabolically healthy, accelerates age-related declines in functional ability and poses a threat to independence in older age[38].

In Malaysia, Non-Communicable Diseases (NCDs) are estimated to account for 73 percent of total deaths with 35 percent of these deaths occurring in those people under 60 years[39]. Premature mortality occurs in 4 major groups of NCDs such as cardiovascular disease, cancers, diabetes, and chronic respiratory diseases. The probability of dying between ages 30 and 70 years from these 4 main NCDs is 20 percent[39].

Impacts on Individuals:

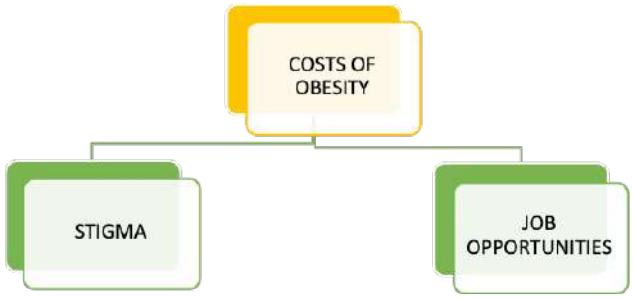

Figure 2: Cost of obesity on individuals

Individuals have greater likelihood of unemployment and are likely to receive lower salaries as a result of obesity[40]. Loss of productivity due to work injury and longer recovery time will make them unpreferable worker. In addition, demand for support services and disability management is likely to increase because of obese conditions that limit their basic physical abilities[41]. When gender is taken into account, the impact of obesity on salary varies between man and woman, whereas the obese woman receives lower earnings than the non-obese counterparts[42]. On the contrary, their non-obese counterparts are getting high pay customer related jobs which require attractive personalities like representatives of sales and customer relationships[43].

Study[44] in Malaysia found that about 30% of the students agreed out of 93 obese participants that the body weight limits their ability in every type of work. Approximately 50% said their work was linked to sedentary behavior and poor mobility. 63% of respondents believed they were treated differently because of their weight. Moreover, 73 of them felt that their supervisors should take account of their weight in delegating jobs. Altogether, most participants accept that the body weight impacts and reduces their performance.

In contrast, study[45] indicates that employee recruitment does not consider the appearance and gender of employees since performance, background and age are more concerned. Nevertheless, physical fitness and

health in the public sector are one of the requirements used during the new recruitment staff's interview and selection[46]. Obesity are perhaps overlooked in the workforce due to the physical and wellness lack of evaluation. On top of that, salaries and performance are not a consideration because the wage system for civil workers is rather sticky to seniority and education background[47].

Conclusion

In summary, obesity has grave implications for economic growth and individuals productivity because it ties with many NCDs. This study aims to propose additional research for a group with great influence over future generations such as teachers, so that they can give more insight and support the development of multidisciplinary teams, equipped to address the problems associated with various types of interventions.

Conflict of Interest: Nil.

Source of Funding: Self-source.

Ethical Clearance: Done research committee.

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Does Instagram's Like Affected Teenager Self-worth?

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Abstract

This literature review was conducted to identify that instagram's like affected teenager self-worth. We know that instagram has become a phenomenal social platform with 800 million user around the world. While, Indonesia has become the big 3 instagram's user, after America and Brazil with about 60 million user. Instagram was super phenomenal among teenager, like every teenager are active instagram users, and while teenage is an age to search identity, so it's so much important to know that teenage self is worth it. Well we know that instagram provides picture, followers, comments, likes, direct message etc. which make people get in touch easily with other people, building a good relationship, make us feel happy while receiving likes, comments and other responses from others. Besides that, there are a pressure for someone to get likes, some comments and followers that can produce a high anxiety, social pressure and it can make our self-feel unworthy. These phenomena correlated with a part of self esteem, called self-worth. Self-worth is how someone see their own value or worth as a person. While knowing source of self-worth, achieve something, approval and acceptance from others, virtue or one's judgment of moral adequacy are sources of self-worth which can easily gained by instagram's like, means that we can also get self-worth by instagram's like. The result of this study found that, instagram's like is affected self-worth.

Keywords: *Instagram, teenager, self-worth.*

Introduction

Nowadays, people use social media, every people, everyone from kids, teenage, till adulthood even late adulthood. It just like something that all of us should have, since we can do everything on social media, we can doing interaction, chatting, calls, we can trading, doing virtual shopping, everything we need, social media serve us. Theres so much kind of social media, the most popular is facebook, twitter, and instagram. Wiederhold[1] said that social media is a revolution, it presented people with an opportunity to express themselves and interacted with others in an interesting way. However, while social media provide friendship sharing and interaction, social media also have some negative vibes and few are quite as detrimental to a person's health and well-being as Instagram. While Wiederhold[1] said, instagram was noted as the most destructive platform for disturbing time and quality for sleep, shaping an body image, and fear of missing out from a circle if we don't follow others movement. If we compare instagram to other social networks, instagram could lead us to thinking about unrealistic expectations, feeling worst, and low having a low self-esteem.

Talking about self-esteem, there's a part of self-esteem which is important yet so risky influenced by instagram, that is self-worth. Words by words, *self-worth* defined as taste of someone's value as a person[2] Self-worth is important for teenager, according to Ericson psychosocial stage, teenager is on the fourth stage of whole life. In this transition age, teenage energy was transformed to get knowledge and intellectual ability. This stage called identity vs identity confusion, where someone faced on a needs to find identity and what teenage will do on their life[3]. On this "finding identity" stage, it's so much important to know that teenage self is worth it, while we know that instagram is suspected can affect teenage self-worth, we have to make sure that teenage get their super good self-worth so they'll feel worthy and get positive image of their self on finding identity stage, if teenager didn't have self-worth so they can't find their identity till they can't living their live because teenager doesn't know who they are, teenager

don't know what supposed to do, don't know their self well, and this self-worth can be affected of instagram's like so this research is super important to do.

Literature Review:

Instagram: Instagram ia an application for everyone, especially those who have proper devices, because its application require some term which is fit to photos in a high pixels[4]. Through Instagram, someone can upload photos or videos, publish them, and showing them on others timeline. People who use instagram called instagrames. Instagramers can easily share photos and videos with others on their timeline with caption and hashtag to receive comment and likes on their timeline posts by their followers.

Instagram has become a phenomenal social platform with 800 million users per January 2018. Indonesia has become the big 3 instagram user after America and Brazil with amount 60 million users[5]. According to Lee et al[6]. people have five social and psychological motives when using instagram, they are archive or collecting moment, social interaction, expressing their self, escapism, and peeking, but these motives are not always without negative consequences. By uploading different photos and videos, people can choose what they want to show on Instagram. This is absolutely just to get positive thing from like or comment from their followers[7].

Every instagram post consist of like and comment button, so its users can clickingthe like button to show their approval and tap the comment button to express their thought of a content on the photo/video. Ting Ting[8] beside that fun thing, people tend to get like or followers on instagram, meanwhile, there is a pressure to receive comment followers and likes which can culminate social pressure and also high anxiety. In fact, an account on instagram can detect someone on mental illness. Current study shown that computer script can be used to detecting depression by knowing its dominate color and with who they socialize[1].

In Indonesia, some people offering follower needs, likes and comments on social mediaslike youtube, instagram, even twitter, in addition to website visitor services.Other services that can be chosen by clients are auto-followers and likes. Especially for follower services, there are three types of needs: active, passive, and mixed. Saptaji (the seller) said he served clients from various circles, ranging from ordinary people, celebrities, celebrities, celebrity agencies, companies, fashion brands, to political figures.The process of purchasing services is easy. Buyers need to provide a username without a passcode so it can be processed for 30 minutes to 24 hours, by various price[9].

For millennials, having so much followers and 'like' seems like quietly important, it define their social status, when you have so much followers and like, you sit on the high class of social status. Usually, people who used to buy followers and likes are coming from personal accounts, that is, those who want to become"selebgram" celebrity on instagram. It means that for the sake of popularity in social media, a lot of people are willing to spend on buying followers and 'like[10].

Self-worth: Self-worth is a value, it's the appraisal that our brain us importance and significance as a person Selby[11], Words by words self-worth defines as the taste of someones value as a person[2].

Lots of things affect Self-worth, they are the environments in where we live, study, and socialize, how we believe in our performance in different settings, what other people say to us, and the ost important is what we say to ourself. Of all the things that affect our sense of self-worth, self-talk is the most powerful way to increase our self-worth. That means it is very important to get into the habit of replacing unhelpful thoughts like 'I am a fool' or 'No one love me' with helpful ones like 'Im great' and 'At least my parents love me'. That is, it appears that people's general sense of self-worth is determined by three distinct factors; first, their positive and negative feelings about themselves, second, their specific beliefs about themselves, and the last is the way that they frame these beliefs[12].

There also another sources of self-worth, they are: outdoing others in competition, others approvals, academic competence, physical appearance, family love and support, being a virtuous or moral person, and God's love[13].

Kabir[14] said that, we have to know these things to get our true self-worth. First of all we should know our sources of self-worth. Knowing what we love, what we interested in and doing some positive things that make us feel alive. The second is recognize our inner critic, it's our ego, feeling of worried if someone disapprove ourself. And then see a different perspective of self-care from self-consciousness. Self-care is a part of our self-worth. The last is be aware on social media. nowadays, social media is a source of approval from others, yet

also source of envy and jealous of others, based on likes, followers and comments.

Teenager: Teenager or adolescence is an transition age from children to adulthood[15]. According to the theory of psychosocial stages by Erikson, adolescence is included in the fourth stage of all stages of human development. In the transition phase from children to adult, teenage's energy has diverted to gain intellectual knowledge and abilities. This stage is the development stage of the ego identity vs. identity confusion, where the individual is faced with the need to find his identity and what he will do in life. Important thing in this stage is to explore alternative solutions to the role of individuals in life[3].

A study by Kaiser Family Foundation said that, teenager (11–18 years) spend their 27 minutes spending on social media each day[16]. Previous study show that motives for why people using instagram were positively related to Instagram usage and self-presentation, and the number of Followers was also positively correlated with Instagram usage and self-presentation[8].

Methodology/Materials

This literature study was conducted by looking for references that relevant to this study case, they are instagram, self-worth, and teenager. We used theoretical references from book, journals and other scientific literature which is used as sources of data to be reviewed.

Results and Findings

A well-known social media platform which is evolved nowadays is instagram. Instagram has become a phenomenal social platform with 800 million users per January 2018. We can do anything on instagram, like communicating with other, selling something, branding, knowing current activities of our friends, and so on. Those activities can be done by uploading photos, videos, giving like, comment, follow and unfollow. People try to upload good picture of their self, their moment to gain much instagram's like. besides, there is a pressure to receive comment, followers and likes which can lead us to hing anxiety problem and also social pressure[1] Gaining instagram's like activities are addictive. People will feel loved, worthy if they get more like, otherwise, they will feel unworthy if they don't get much like. These phenomena caused a lot of instagram's like seller in Indonesia. People tend to buy like from seller just to show that there's so much people who liked their post, it make them feel worthy, even they buy it. This is correlated to an opinion from Rozi[10] that for millennials, having so much followers and 'like' seems like quietly important, it define their social status, when you have so much followers and like, you sit on the high class of social status. Usually, people who used to buy followers and likes are coming from personal accounts, that is, those who want to become"selebgram" celebrity on instagram. It means that for the sake of popularity in social media, a lot of people are willing to spend on buying followers and 'like[10].

Indonesia has become the big 3 instagram user after America and Brazil with amount 60 million users[5]. While the most of the user is teenager. Teenager or adolescence is a transition age from children to adulthood[15]. According to the theory of psychosocial stages by Erikson, adolescence is included in the fourth stage of all stages of human development. In the transition phase from children to adult, teenage's energy has diverted to gain intellectual knowledge and abilities. This stage is the development stage of the ego identity vs. identity confusion, where the individual is faced with the need to find his identity and what he will do in life. Important thing in this stage is to explore alternative solutions to the role of individuals in life[3]. On this finding identity stage, adolescence need a good insight which can make them know who they truly are, and they know whats the best for their self. Theres so much things that distract adolescence/teenager on this stage, some teenager choose to be a diligent student, some of them choose to be mischievous student, some of them choose to be confidence, some of them choose the opposite. It depends on what they know and what they want to be, it also depends on what they see their self as a human being, like they know the value of their own self. So teenager on this stage actually need a self-worth. We know that self-worth is the value that you placed on you, it's the appraisal that our brain makes of your importance and significance as a person[11] if we don't gained self-worth we'll feel unworthy, we don't know the value of our self, we don't know who we are, so we can't define our identity.

There are so many things that affected self-worth, while some points of sources of self-worth are correlated with gaining instagram's like among teenager, as we know that Wiederhold[1] said that social media provide friendship sharing and interaction, while we know that teenager is a stage where we have to find our identity yet also time for having intense hangout with friends,

that's why teenager need to be approved on their peer group, this is how self-worth play an important role on this stage, and the source of self-worth which highly correlated to instagram's like are others' approval, what other people's and what we say to us. We started from "what others approval" as we stated above, people feel loved, worthy, feel getting a high social status when they get much instagram's like, it feels like theres approval from other people. When we know we've been approved by others, we start to think what other people say to us, and we say it to our self, we ask our self. We'll like to say "omg, I gained so much like, I know they love me" or "omg, theres no one like my instagram photos, does anybody hate me?" besides, Kabir[14] said that, to gain the best self-worth we should be aware on social media. Social media is a source of approval from others, yet also source of envy and jealous of others based on likes, followers and comments.

Conclusion

Based on the result and finding above, we know that there is a social media platform which become a place for gaining approval through "like" among teenager and it can affected teenager's self-worth on finding identity stage, that was instagram. When we gained so much like on instagram, we'll feel approved, we feel loved, worthy, so we start to think and say to our self that people like us, people loved us, and we'll feel worthy.

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The Application of MOPSI Module Forbreast Cancer Patients

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Abstract

Pressure or stress is a common occurrence or experience in every individual's life, especially to those that are afflicted with an illness, However, what distinguishes it is the patient's perception of the pressure itself. There are numerous events or situations that occur in life that trigger the existence of stress on the patient. These trigger factors arise in many forms such as physical, behavioral, social, emotional, and their own thoughts. The effect of stress on the patient is related to the attitude, character and the perception derived from the pressure. This article intends to identify stress changes in breast cancer patients after the apllication of MOPSI module. This study was carried out on two breast cancer patients using a detailed interview method and observation. Data was analysed using Nvivo11 and triangulation. The findings show that patients that consistently applied MOPSI experienced positive physical, psychological and social changes. The application of the MOPSI module significantly changes daily routines to become healthier and reduces the pressure or stress experienced.

Keyword: *Application, Pressure, Breast cancer.*

Introduction

Stress in breast cancer patients is the highest compared to other cancers. It is evidenced by 2011 statistics that show 2.72% of cancer patients become stressed from the pain they suffer[1] Cancer can easily spread if the patient experiences emotional stress, extreme stress, trauma, loss and depression, thus disturbing the patient's mental health and hormones that can weaken the body's immune system of breast cancer patients. The psychological effects that can be seen are difficulty in accepting reality, anger, fear, worry, sadness, hate, irritation and shame. Thus, the stress faced by the patient should be fully treated and every cancer patient should be asessed by supporting them physically, financially and morally with love and affection[2]. To help reduce the stress of breast cancer patients, this research designed a module based on Islamic concepts and practices sourced from the Qur'an and Sunnah that can be practiced by patients as part of their daily routine.

MOPSI Module: MOPSI module is a module that helps breast cancer patients manage the stress that they face. This module is designed based on Islamic concepts and practices sourced from the Quran and Sunnah that the patients can perform as part of their daily routine [3]The practices selected were not only supported by their advantages in the Quran, but also acknowledged by science and members or experts of the medical field.The main purpose of this module is to propose method and to remind patients of the importance of preserving the relationship with the creator of all creations i.e. Allah S.W.T.The design of the module also aims to guide the patient to be more positive and to have good thoughts of Allah's predesination.

This module consists of five main sections[4] i.e. :

i. Therapy module

ii. Therapist

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iii. Client or receiver

iv. Therapy methodology

v. Observation and assessment

Methodology

This study is based on a qualitative methodology using a case study approach to explore the changes experienced after applying MOPSI modules. Data collection was made using face-to-face interviews and observation method. The interviews and observations were conducted in 12 sessions. The data were analysed based on thematics using Nvivo 11 software and data triangulation processes. In order to ensure the information obtained is accurate and reliable, different sources were referred for the same thing. This study was carried out on research subjects that were selected using purposive sampling technique. This sampling technique is a selection pattern that is simple and purposeful. The subject is able to provide the value of data required by the researcher based on the situation and behaviour of the invidual that is being studied [5]. Researchers found the subjects through *'snow ball'* method or information from one party to another about individuals suffering from breast cancer [6].Therefore, two breast cancer patients were selected by the researcher as subjects based on experience of suffering breast cancer.Total of four experts were selected to evaluate the validity of the module and provide assessments.The experts were given a month to evaluate the module.This method is in line with the method highlighted by [7], that recommends the enlisting of expert asessors to determine the validity aspects of the contents.The response received by the expert asessors were used as a guide by researchers in improving the module.Improvements were made to enhance the module's contents that were practiced on breast cancer patients.

Examples of interview questions are as follows:

1. Does the contents of this module fulfill its target population?
2. Does the contents of this module work perfectly?
3. Does the contents of this suit the time allocated?
4. Does the contents of this module improve performance?
5. Does the contents of this module changing attitude towards a more positive one?

Research Findings and Discussion

Research findings showed that patients changed towards a more positive attitude after applying the MOPSI module. Changes in stress can be seen from physical, psychological and sosial aspects. Findings were analysed through interviews with researchers to see the effects on the patients prior and during breast cancer.

Based on observations and patient response, it can be noted that patients were able to cultivate positive values within themselves. It was notable that the patients had undergone positive changes physically, spiritually, psychologically and socially.

i. Physical: The movements of Research Subject 1 and Research Subject 2 were limited even in their own home, due to immense physical pain. After comsuming health foods such as bee honey, Research Subject 1 and Research Subject 2 admitted that their breasts felt lighter, compared to previously feeling very heavy due to cancerous lumps. After several sessions were conducted,the researcher observed that they were still mobile and able to attend lectures such as mid-morning lectures. The researcher witnessed in person Research Subject 2 attending lectures at Saidina Hamzah Mosque. Subsequently, meetings between the researcher and Research Subject 2 were held Saidina Hamzah Mosque. This can be linked to the course of treatment recommended for the patients i.e. to take the medication prescribed by medical doctors and consume health foods to improve their well being, which caused the patients to feel lighter and made it easier for them to move and perform indoor and outdoor activities. Research Subject 1 was unable to meet with the researcher at the beginning ofthe seesion due to chronic pain, but was able to do so after feeling better.

Research Subject 2 commented;

"Feels lighter after taking UNIPEQ UKM bee honey . My breasts no longer feel heavy, it feels different. I am confident that there is a cure for every illness, as mentioned in the Quran".

Whilst Research Subject 1 commented:

"Feels lighter after consuming bee honey.."

They became more confident after finding a translation of the Quran that describes bee honey colours

as black, brown, dark yellow and clear.In addition to being aware of the benefits of bee honey, Research Subject 1 also commented that when in pain,she is unable to attend congregational dawn prayers at the surau. She performed soul therapy and prayed to be granted good health to be able to perform acts of worship especially congregational dawn prayers. As a result, Research Subject 1 is currrently able to go to the surau as usual.

ii. **Spiritual and Psychological:** From a spiritual and psychological point of view, it was observed that the patients had undergone good behavioral changes such as avoiding arguments and overthinking problems.The Islamic psychotherapy module encourages the patients to follow the personality traits of Prophet S.A.W[8,9]

" no longer feel like going to my brother's house, because it will just make me upset. Even my children said to just spend Hari Raya here in Kuala Lumpur. Going to my brother's house would just make me upset and stressed.."

After frequent visits to her brother's house, Research Subject 2 decided to stop going to his house to avoid any disagreements and being disrespectful while being there.

Research Subject 1 said;

" I acted deaf. I kept quiet. I just gnored it, if I answered back I would just feel hurt and sad, so I ignored it, keep quiet. I didn't care before, because my body was strong. Now, I don't want to fight back, since I am ill. So I just keep quiet. The matter gets solved by keeping quiet. Then I do it,for example ironing clothes. My husband said, "The clothes are crumpled, why didn't you fold the?" Subject 1 answered " I've been folding them for years and there haven't been any problems". Then, I asked my child to help iron them, since I'm unable to stand for long, so I asked my child to help. " Take this shirt quick and iron it, your father is stressed, when I'm stressed too, keep pressuring me. Sometimes I cry whilst ironing, at 3 o'clock in the morning I'm still not finished. I want to sleep. In the end I called my child, " Take this, your father's shirt, I'll give you money later".

From a religious prespective, they perform the compulsory and optional acts without being told or forced by anyone.In fact, they read the Quran and it's translation with the purpose to understand and relate to the words and commands of Allah S.W.T.From the point of practice and appreciation therapy, as well as soul therapy it is evident that it is practiced by the patients throught the patients speech as follows:-

Research Subject 1 said:

"Dhikr, reading the Quran and prayer are done abundantly. I continually recite dhikr, al-Ikhlas, I go to sleep holding the prayer beads whilst reciting al-Ikhlas. Illness brings closeness with Allah. Oh Allah, I know you are with me, with the blessings from dhikr, blessings from reading the Quran, blessings from giving alms and charity, getting closer to Allah, this illness has been for too long and I've never felt so much pain in my life . Just confide in God..."

Researcher observed that Research Subject 1 tone of voice changed and became teary.

Research Subject 2 said:

" Before the break of dawn, during pre-dawn meal, is the time to recite istighfar 70 times. I do it 70 times, didn't Allah say to remember Him when lying down, sitting, sleeping, remember Allah to calm the heart. I'm telling you this not to show off, I've read 12 chapters of the Quran's translation . Usually we read the Quran in arabic, but don't read it in Malay. So, we don't understand. When we don't understand it, the devil can overpower us. The devil is unafraid. The devil becomes afraid when we understand the Quran. So that we don't fall prey to the tricks of the devil"

Besides that, the patients also implemented alms and charity therapy[10]and social therapy[11, 12]as outlined in the module. Apart from attending lectures, Research Subject 2 admitted that:

" there have been emotional changes and I can control my emotions, happiness, fun, I don't think of tensions when preparimg food, when making ketupat palas for the masses during Hari Raya celebrations at the surau, visiting relatives, meeting people, I enjoy it when people visit my home, when the students from Darul Quran come to my home, I feel happy'.

Research Subject 1 on the other hand prepared food for the congregation at the surau and said:

"During Ramadhan, I prepare for 20 people a day. In a week, for 5 days, 100 people. My interaction with my children have become closer, even with outsiders. I haven't seen you for a while, where have you been? They ask my husband about my wherebouts. When they

know that I'm unwell, they come for a visit. I hope for a loving relationship with my neighbours. I want friends that would visit and pray for me when I die, when there are three rows, the prayers would be accepted. Pray for entry into heaven. Alhamdulillah".

Therefore, the researchers see that habits and appreciation are related to psychotherapy. The creation of this therapy leads the society to become more grateful in order to relieve themselves from problems faced, thus achieving contentment in life and the hereafter. Islamic psychotherapy treatment has long been used in treating patients with emotional stress, as well as effecting them positively physically and mentally. A form of therapy that can have a great impact on patients especially illnesses that lead to stress and mental stress[13,14].

In Islamic psychotherapy, spiritual values are a key aspect of solving human psychology problems because they are closely related to the heart and are more likely to affect human life[15.]Although humans comprise of two components, namely physical and spiritual, the spiritual aspect greatly affects the individual because the heart is like the king and the human body is submissive to the heart. It is also a major driver of actions, and actions of the human body known as behaviour in the form of self-sacrifice or `ubudiyyah to God through the abandonment of all efforts and planning due to seeing every occurrence as Allah's fate [16].

iii. **Social:** Participating in a community that enjoys seeking knowledge helps to prevent stress by recognizing the importance of human relationships as well as the relationship with God. This helps in overcoming emotional stress disturbances more effectively with the presence of a good friend or society of good morals. This activity is held once a week and aims at improving mental and physical health[17].

Both breast cancer patients were more motivated after gradually practicing psychotherapy. They were able to overcome their bad habits such as impatience, irritable, difficulty relaxing, sadness, easily offended, worrying, feeling anxious and being sensitive[18, 19].This Islamic psychotherapy module proves that a relation exists between religious influence and spirituality on patient behaviour and morals. Relief from problems through concept comprehension therapy, practice and appreciation therapy, soul therapy, social therapy and personality therapy of Prophet S.A.W can help manage stress faced by breast cancer patients. Implementing these therapies with discipline, persistence, consistency and patience has proven to create new habits through actions, speech and new behaviour. They realize that prohibited traits are bad and should be avoided, and to fill the heart with commendable traits such as presevearence, patience, self-reflection, submissiveness and moderation in wordly matters. When faced with a problem, they return to Allah SWT[20].

Conclusion

In conclusion, the stress experienced by patients had a positive change after applying the MOPSI module. The module was designed based on Islamic concepts and practices that are sourced from the Quran and Sunnah as well as views by Muslim scholars as their daily routine. The results show that the changes can be seen from physical, psychological and social aspects. This module emphasizes spiritual aspects as the internal effects gives impetus to the actions of the human body.

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Source of Funding: Self

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A Study on Consumers Perception on Halal Certification of Dietary Supplement Products

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Abstract

The global health industry market perceives anenormous potential of profit within the dietary supplements business. Contributed by the changes in consumer perception in accepting that supplements aids in prevention of diseases, the number of supplements available to consumers has seen tremendous growth. As the supplements industry expanded with new innovations and advanced of technology, the consumers lose transparency in knowing the process, composition and ingredients of the dietary supplement products. They are expose to many risks of the dietary supplement products that includes the safety, efficiency and quality aspects. Certifying the supplements as halal may safeguard the safety, efficiency and quality of the products as halal is attached to the concept of 'thoyibban' that upon compliance will accord assurance on the safety, efficiency and quality of the product. In suggesting for the reformation of current consumer protection on this area, the study intends to analyse the effects of halal certification on dietary supplement products to the consumers. The ultimate aim of the study is to answer questions whether there is a significant effect attaching halal certification on the dietary supplement products to boost the confidence of the consumer on the safety, efficacy and quality aspect of the products. This will assist in the direction of reformation over the current consumer protection framework. The study adopts a mix method of qualitative and quantitative method. The qualitative method embarks onanalyzing the fundamental principle of 'halalanthoyibban" and its relation to the assurance of safety, efficiency and quality of dietary supplements products. The analysis of data acquired through qualitative method involve content analysis approach on traditional and contemporary sources of Islamic laws. The data acquired through content analysis is supported by semi-structured interviews with respondents that has been selected through purposive approach. The second part of the study uses quantitative method by distribution of questionnaires to selected consumers of dietary supplement products. The findings to the study disclose the effects of halal certification on dietary supplements product that may assist the policy maker and industry to make appropriate reformation to the consumer protection framework within this industry.

Keywords: *Halal certification; Dietary supplement products; Thoyyibban concept; consumer protection.*

Introduction

Globalization has transformed many industries from the traditional/conventional ambiance to a modern and a technology based industry. Among the transformed industry are the food, pharmaceutical and dietary supplements industry. Dietary supplements are products that are labeled as *dietary supplements* and are not represented for use as a conventional food or as a sole item of a meal or diet. Supplements can be marketed for ingestion in various forms such as capsule, powder, soft gel, tablet, liquid, teas, or any other form. Although dietary supplements have aided in the maintenance of the quality of life, yet the market is flooded with dietary supplements that are associated with many risks that includes the safety, efficiency and quality aspects. In addressing this issue this study intent to

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explore the usability of the *halalanthoyyibban* concept in safeguarding the rights of the consumer involving safety, efficiency and quality. To what extentwould the consumer know that a dietary supplement product that is certified halal provides an assurance of these three aspects. The knowledge of the consumer may become the guideline in the reformation of the current practice in bridging the *halalanthoyibban* concept to the dietary supplement industry.

Literature Review: There are diverse products of dietary supplements that are also termed as health supplement or nutritional product and may range from foods modified or pure forms of vitamins and minerals to extract of various botanical or animal products[1-2]. In a study[1] the researcher disclosed that the dietary supplement products are commonly for medical problemsincluding sexual enhancement, weight loss and sports performance. These products are freely available atnumerousoutlets. The marketing trend of this product sees the producers claimingthat they areideal for the maintenance, prevention and even treatment of chronic diseases.According to Sauer[2]dietary supplements encompass a wide spectrum of products, including vitamins and minerals, such as folate and calcium; herbal therapies and botanical agents, such as ephedra and ginkgo biloba; and enzymes or extracts from organs or glands, such as some "hormone" preparations.

Most authors[2-3]agreed that dietary supplementfunctions as a booster to the immune system, supplements the diet,reduce the risks of illness and age-related conditions, and improve performance in athletic and mental activities as well as to support the healing process during illness and disease.

Writings on the area of halal have started since the 1980s when the Prime Minister at that time, insisted on the setting-up a proper institutionalize management system of Islamic matters that include a proper management of halal related issues [4]. Since then, several studies were conducted on numerous areas and scope of halal particularly from the social perspectives.

The writings that were focused on the consumption behaviours [5-7]and medication behaviours[8-11] agreed that halal rulings have contributed to the shaping of the consumption and medication behaviours of many consumers. Even though there were observations on the effects of halal consumption behaviours on the formulation of government policies but studies on appropriate tools and mechanism to execute the halal policies were not addressed[12].

Substantial literatures [13]were based on the theological study of halalas a background to the concept of halal pharmaceuticals. This includes the study on Shari'ah rulings which also serve as relevant determinants of the halal status of any pharmaceutical product. These studies [14-18] discussed the Shari'ah principles relating to halal such as Istihalah[19-20] (transformation), Istislak (assimilation), Dharuriyat (necessity), Maqasid Shari'ah (for the public interest), the scope of halal, [21]the underlying reasons for the command to consume halal, the connection of halal and *thoyibban*and the common usage of halal in daily life. Al-Qaradawi[18]in his book Al Halal Wa al Haram fi al *Islam,* focused on the Islamic legal approaches which aim to offer better understanding on the operation of halal rulings in societal life including the application of rulings on halal in seeking for medication.

There are various writings[16,22,23]on halal pharmaceutical that includes the growth of halal pharmaceutical industry [24-26] and the issues that surround the issues of halal certified products mixed with non-halal derived genes to enhance the growth process, reports on manufacturers who were not adhering to labelling requirements, the need to have proper and transparent labelling for halal products [27]the complex composition of modern drugs and medicine [28,29]that requires the switch of the old rule [11,2131-32]from *caveat emptor* to *caveat venditor,* the discovery of non-halal ingredients in drugs, [33-36]and the doubtful status of some medication and drugs [37,38]. Even though there are abundant literatures on halal, these literatures did not specifically address the issues surrounding the developing industry of dietary supplement in connection to the possible assistance of adopting halal concept in the administration of safety, efficacy and quality.

Problem Statement: Supplement production flood the modern market due to the demand of consumers. Consumer demanded supplementary product due to increase of awareness and changes in lifestyle. Lately supplementary product is attached to issues of safety, efficacy and deterioration of quality. Halal assurance can be one of the solution to assure the safety, efficacy and quality of supplementary products. However, not many consumers understand the concept of *halalanthoyyibban*. Though there are many studies conducted on supplementary products and halal based

research, the studiesonly focuses on the theological study, marketing and business strategy, financial impact, health related issue and economic discussion. To date there is an absence of studies that relates the understanding of consumers on the ability of halal certified product to assure and safeguard the safety, efficacy and quality of a product. Hence it is the aim of this research to undertake the study in this particular area.

Methodology

The study adopts mix method of qualitative and quantitative method. The qualitative method embarks on the analyzing the fundamental principle of '*halalanthoyibban*" and its relation to the assurance of safety, efficiency and quality of dietary supplements products. The analyzing of data acquired through qualitative method involve content analysis approach on traditional and contemporary sources of Islamic laws. The second part of the study uses quantitative method by distribution of questionnaires via online forms and consumers who visit the pharmaceutical stores.The following are the charts representing respondents:

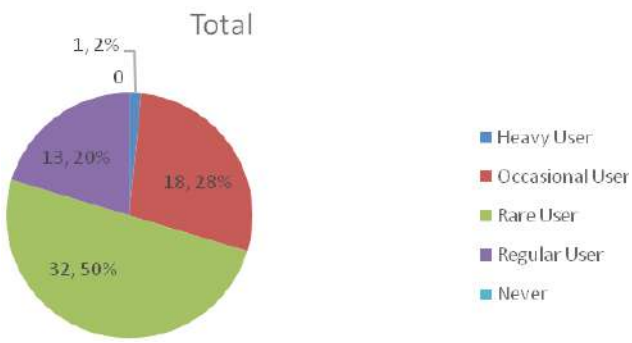

Figure 1

Majority of the respondents are Muslim female who are rare users of dietary supplement products.

Discussion

Knowledge on Dietary Supplement:

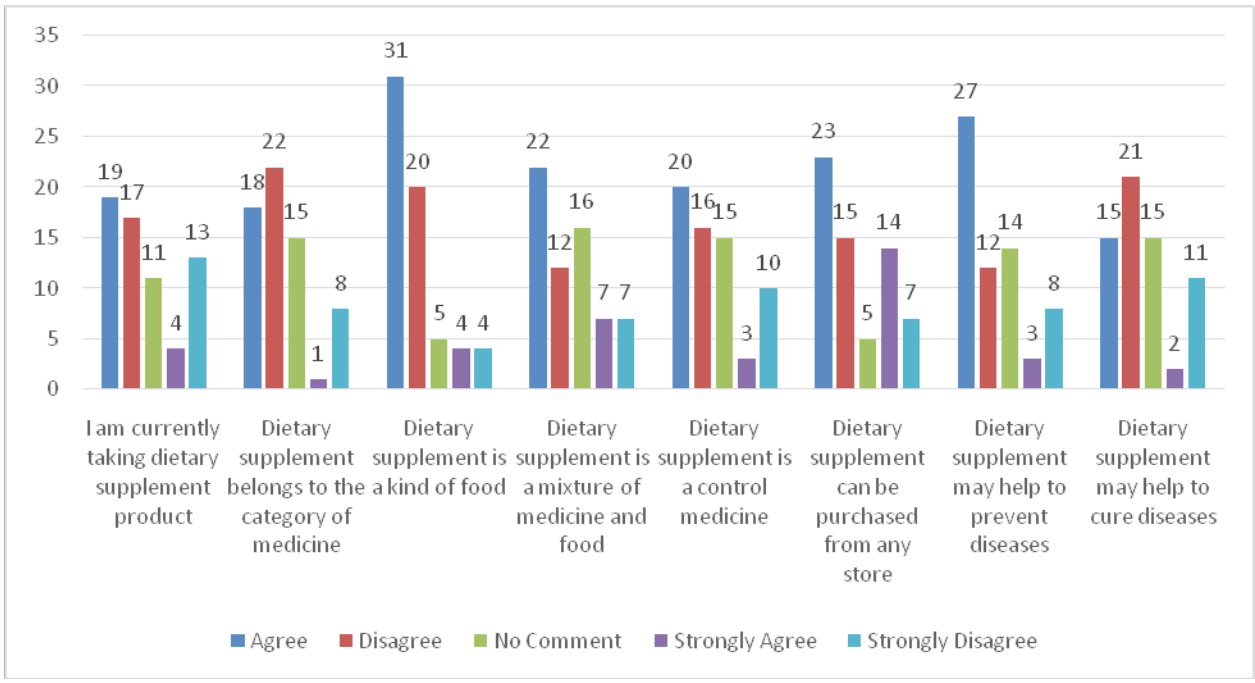

Figure 2

The analysis showed thata majority of the respondents were aware of the existence of dietary supplement products in the market as a majority of them are currently consumers of dietary supplement product. Questions aiming at testing the ability of respondents to classify dietary supplement product into the group of food or medicine received a majority answer that the dietary supplement product is more of a food product rather that medicinal product. However, when posted with questions of the possibility that a dietary supplement product is a mixture of medicinal and food component, many are uncertain as to this possibility. It is also discovered that

the respondents believe that the function of a dietary supplement product is to prevent diseases rather than to cure diseases. In summary it can be said that most of the respondents have a profuse understanding of the actual concept of dietary supplement product.

Knowledge on Halal Concept:

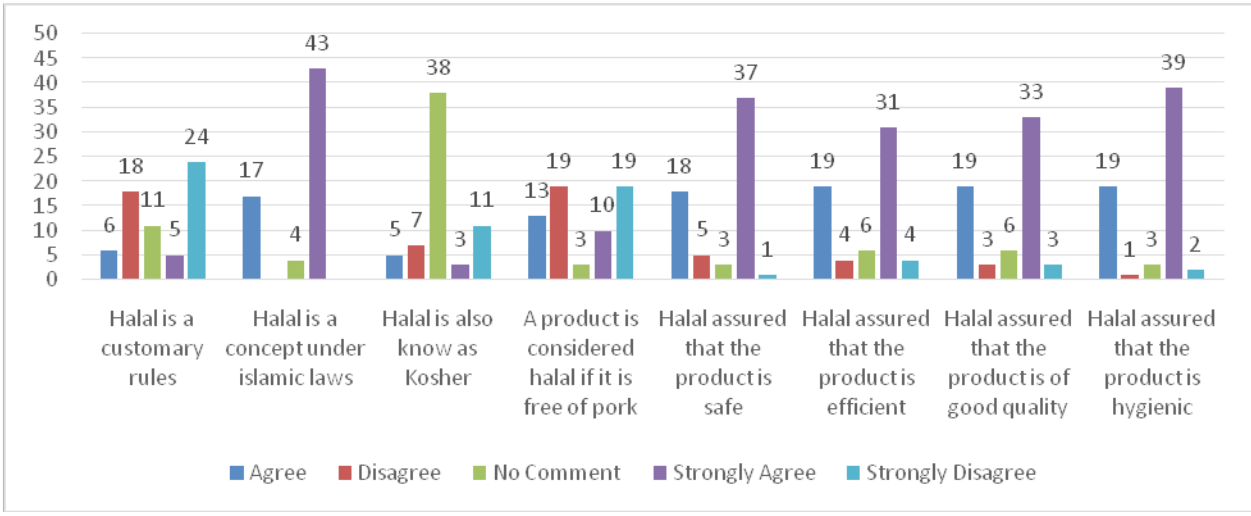

Figure 3

The analysis of this theme showed that not many consumers have sufficient knowledge on halal and its association to dietary supplement products. A majority categorised halal as a branch of Islamic law, whereas halal is a dietary concept and guideline for Muslim and not a component of Islamic law. A Muslim who consumes non-halal is a sinner and not a criminal. When asked on whether halal is a part of Customary law or a Kosher Dietary guideline, majority answered in denial showing that they are certain halal belongs to rulings of Islam. When the question tested them on the actual understanding of *halalanthoyibban* concept, the respondents showed that they understand well that to get a product to be certified halal it must not only be free from any pork- based substances but there are other guidelines to be complied with. A majority of the respondents strongly agreed that halal may assure the safety, efficacy, good quality and hygienic aspects of the products.

Associating Dietary Supplement With Risk:

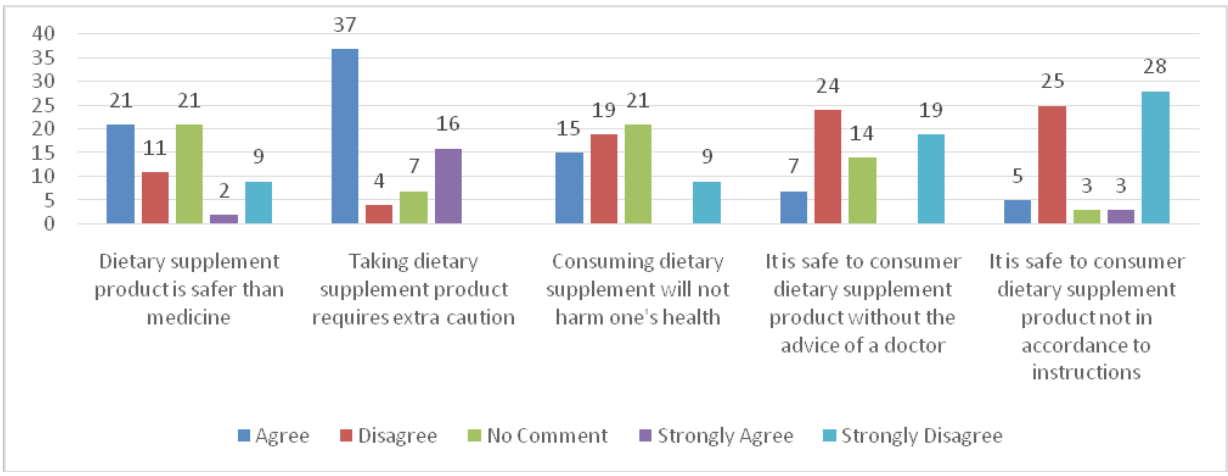

Figure 4

The analysis on this theme disclosed that a majority of the respondents are cautious consumers. Even though a majority agree that consuming dietary supplement products exposes them to a lesser risk than a medicinal product, they agreed that the normal rule in taking medicine (such as it has to be taken with doctor's prescription) and consumers must take the dietary supplements according to the instructions attached to the product.

Desire to Purchase Dietary Supplement:

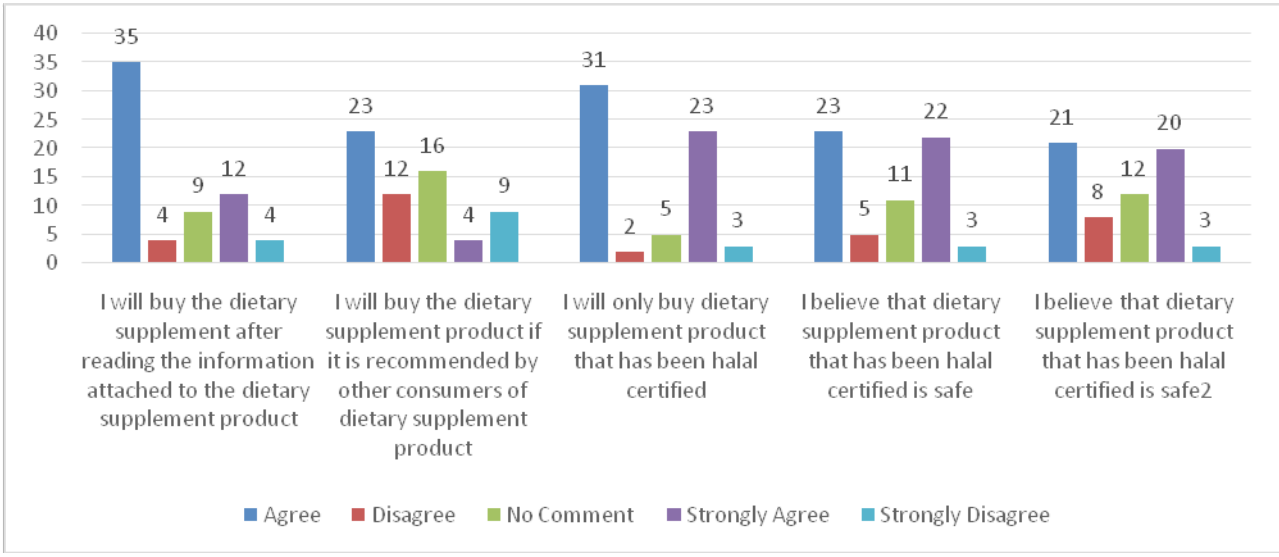

Figure 5

From the analysis it can be summarized that the desire of respondents to purchase dietary supplement products were very much affected by information attached to the packaging and recommendations by others. As a majority of the respondents were Muslims, the findings showed that a majority of the respondents strongly agreed that they will only purchase dietary supplement product that has a halal certification. They believe that halal label assures the safety, efficacy and quality of the product.

Conclusion

The findings of this research show that a significantly high number of respondents understand the *thoyibban* concept insofar as the quality of products, but not to the safety and efficacy aspects. Most respondents agree that dietary supplements need to be halal certified as an assurance that the ingredients are halal so as to cast aside any doubts. With many cases of people affected by the side effects of certain dietary supplements, it is hoped that the outcome of this aspect of the research would help in the policy making, awareness and formulating a standard operating procedure for manufacturers of dietary supplements to ensure the sustainability of this industry.

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Conflict of Interest: Nil

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Identifying Environment Aspect in Academic Enhancement Support for Student-Athlete Using Fuzzy Delphi Method

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Abstract

Student-athletes who are enrolled at the undergraduate level in higher educational institutions in Malaysia have the challenge of raising their academic achievement. Preliminary survey shows that nearly 40 percent of student-athletes have cumulative grade point average (CGPA) below 3.00. This study aimed to develop an academic enhancement support framework for student-athletes in Malaysian Public Universities. Problems, in order to improve academic achievement among student-athletes, are due to factors of environment that do not support the improvement of academic achievement student-athletes during their study sessions. As a result, student-athletes could not be maintained in the session of study, scholarship, and the implications from the result are they are not allowed to participate in training and also competition. Therefore, the purpose of this study was to identify elements of support enhance academic achievement to student-athletes in aspects of the environment. Qualitative research approach involves 12 respondents representing academia, management institutions and the management of student-athletes to explore elements of support enhance academic achievement in aspects of the environment for student-athletes. A total of 12 experts representing academia, management institutions and the management of student-athletes were selected to analyze the fuzziness consensus of experts. All collected data were analyzed using the fuzzy Delphi method. The result of the analysis found that there are 9 elements in aspects of the environment that fulfill the requirement consensus of experts, which threshold value is equal and less than 0.2, the percentage of the expert group is more than 75%. Therefore, 9 elements of support to help undergraduate student-athletes at public universities to improve their academic achievement.

Keywords: *Academic Enhancement Support, Student- Athlete, Environment, Public Universities, Fuzzy Delphi Method.*

Introduction

Students are the main asset of each institution of higher education in which students academic achievements plays an important role in producing high-quality graduates to transfer on the social and economic growth of the country forward [1]. It is important for the administration and lectures in higher education institutions to focus on the academic achievement of students in which even companies and industries are also interested to have for their company. Academic achievement is one of the factors that highly considered by employers in recruitment, especially for fresh graduates. Academic achievements of students are assessed with a cumulative grade point average (CGPA). CGPA shows the average grades of all examinations for all semesters in the University [2]. Unlike ordinary students in Higher Education Institution, student-athletes are the small part of the student population at each educational institution with roles within the campus, have patterns of life and the different needs in their study sessions [3]. As such, most student-athletes earn low academic grades and average score due to the amount of time mostly assigned to give commitments to physical exercise, where at the same

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time as a student where they have the responsibility to meet the requirements of academic (attending lectures, complete assignments, pass exams) during the study session[4].

Literature Review: Most of the Higher Education Institution aims to produce students who earn good academic achievement but the environment of competition in sports and also their participation has resulted in the formation of a branch of cultural intellectual, poor academic performance among student-athletes and too dependent on other individuals from particular support in order to increase motivation for enhanced achievements in the academic and community environment [5,6]. They just enrolled into study sessions at the university or college to cultivate their careers in sports. They achieved a CGPA of low dropout rate, the higher education level and the low percentage of study. According to [7-9],have the opinion that, the student-athletes at the university achieve lower academic standards compared to students who do not involve in active sports. The result of the findings by [6] found that the university administration and the role of coach didn't help in developing student-athletes' academic performance in Higher Learning Institution in Malaysia.

Student-athletes are individuals who are experiencing stress in discharging its duties as an athlete and a student in an institution of learning [10]. This is because, the student-athletes are individuals who serve as full-time students at educational institutions and actively involved in sporting activities [11]. By such, the student-athletes involved actively at the university level or the international level should be given special attention and support as they need to cope with various forms of challenges and requirements during sessions of study [12]. Student-athletes in Higher Education Institution have to learn how to balance their responsibilities in terms of sports and also academic in ensuring balanced academic achievements such as the needs of the institution complied. As such, they should streamline the number of hours in the following sports training activities to ensure that they stay fit and at the same time committed to the academic regulations set by the institution.

A study conducted by [13] mentioned that applicable program requirements academic support for student-athletes at educational institutions which found that there was a problem in the academic performance of student-athletes for individuals involved in sports that are more popular which was because of the lack of academic support from the institutions. In addition, the influence of parents, socioeconomic status and family support structure affect academic achievement student-athletes [14] however mentioned there are any findings of the effects of socio-economic status of parents of students' academic achievement. As such, it is important for education institutions' role in providing financial support to the student-athletes, which could help enhance their motivation to improve academic achievement [10] .

Student-athletes are individuals who are experiencing stress in discharging its duties as an athlete and a student in an institution of learning [10]. This is because, the student-athletes are individuals who serve as full-time students at educational institutions and actively involved in sporting activities [11]. Student-athletes in Higher Education Institution have to learn how to balance their responsibilities in terms of sports and also academic in ensuring balanced academic achievements such as the needs of the institution complied. As such, they should streamline the number of hours in the following sports training activities to ensure that they stay fit and at the same time committed to the academic regulations set by the institution. According to [11], sport in colleges and universities of the United States is hoped to be a part of student life, which sports could be given the same priority as academic needs for students to be able to involve in outdoor activities and to ensure that students can train their physical ability after undergoing routine and daily academic load.

Without a clear understanding of the issues that can affect academic achievement of student-athletes, the sports administration and the Student Affairs was unable to formulate and provide services in support of student-athletes education sessions in education institutions in ensuring success in academia as a whole [1]. However, predicting academic achievement student-athletes is a challenge because this individual sessions study the same as ordinary students but have the burden of commitment and academic and sports at the same time.

Methodology

Fuzzy Delphi Technique was used to explore the support element in environment aspect to help student-athletes at public universities to enhance their academic achievement which a set of questionnaire was developed by the researchers based on findings from the expert interviews. The interviews were conducted with 12 experts specialized in the field of student-athletes. In the second phase, a total of 12 experts were selected to

answer the questionnaire. According to [15] the number of respondents for Delphi technique is usually from 10 to 50, therefore, 12 experts were sufficient for this research. Researchers have set the rationale for the selection of the sample for this face interview based on where (i) the expert is a person who is knowledgeable and expert in a matter of study and field of study as well as know about why and how to implement a thing in these areas (ii) work and have experience in the field for more than 5 year (iii) hold office in dealing with student-athletes for more than one term of study (iv) have the knowledge and are involved in managing the student-athletes in Malaysian public universities. The elements of environment aspects were identified by obtaining the consensus from the participating experts. Table 1 shows the simple Fuzzy Delphi procedures used in determining the elements of environment aspects.

Table 1. Fuzzy Delphi Technique

Phase	No. of Expert	Instrument Design
Phase One	12	Semi-Structured Interview
Phase Two	12	Survey Questionnaire

Fuzzy Delphi Technique: According to[16], the Fuzzy Delphi procedures are composed of six basic steps as follows:

Step 1: Determination of Expert: A total of 11 experts were involved in answering the questionnaires. The experts were chosen based on their working experiences in the related field of expertise.

Step 2: Linguistic Scale Selection: In this research, the linguistic scale comprised five-point scale, ranging from (1) strongly disagree, (2) disagree, (3) moderately agree, (4) agree, (5) strongly agree. The triangular fuzzy numbers (TFNs) are more proper to utilize as compare to the crisp numbers in the sense that it can represent the information more rigid in the real situation (Mohd Jamil, Siraj, Hussin, Mat Nor, and Sapar, 2014). Table 2 shows the linguistic five-point scale:

Table 2. Five-Point Linguistic Scale

Five-Point Linguistic Scale				
Linguistic Variable		Fuzzy Scale		
1	Strongly Disagree	0.0	0.0	0.2
2	Disagree	0.0	0.2	0.4
3	Moderately Agree	0.2	0.4	0.6
4	Agree	0.4	0.6	0.8
5	Strongly Agree	0.6	0.8	1.0

Step 3: Calculate the Average Value: The average value was calculated based on the total of linguistic scale number of each item and then divided by the number of experts.

Step 4: Determine the Threshold Value (d): If the value of threshold (*d*) is equivalent to or smaller than 0.2, it indicates that the consensus and agreement from all experts are achieved. When threshold value is larger than 0.2, second round of data collection has to be conducted in order to fulfil the requirement for Fuzzy Delphi.

Step 5: Consensus of Expert: In this stage, the percentages of consensus of each item and overall item have to be determined. If the consensus of experts is equal to or more than 75%, it indicates that the group has reached an agreement. The procedures have to be repeated to ensure the participating group has come to agreement provided the consensus percentage is less than 75%.

Step 6: Defuzzification Process: The main function of defuzzification process is to determine the ranking and score of item by using one of the three formulas as follows:

i. Amax = 1/3 * (m1 + m2 + m3)

ii. Amax = 1/4 * (m1 + m2 + m3)

iii. Amax = 1/6 * (m1 + m2 + m3)

For the case of this research, the researchers have chosen formula (i) to obtain the defuzzified values as well as to determine the ranking and score according to the consensus of experts.

Data Analysis: The analysis outputs is based on the consensus from the participating experts indicated that there were nine support elements of environment aspects important for student-athletes at public universities to enhance their academic achievement. The nine support elements were financial support, family support, peer support, institution, faculty, management of student-athlete, sport science services and welfare are state in Table 3.

Table 3. Data Analysis

Element	Item	Score Value		Threshold Value, d	Consenfusus of Expert (%)
		Fuzzy Evaluation	Average of Fuzzy Number		
Financial Support	1	9.00	0.75	0.0125	88%
	2	8.60	0.72		
	3	8.40	0.70		
Peer Support	4	8.60	0.72		
	5	8.20	0.68		
	6	7.40	0.62		
Family Support	7	8.80	0.73		
	8	8.40	0.70		
	9	7.20	0.60		
Institution	10	8.60	0.72		
	11	8.40	0.70		
	12	8.20	0.68		
	13	8.20	0.68		
	14	7.80	0.65		
	15	7.80	0.65		
	16	8.60	0.72		
	17	8.20	0.68		
Faculty	18	8.60	0.72		
	19	8.00	0.67		
	20	8.80	0.73		
	21	9.00	0.75		
	22	9.20	0.77		
	23	9.00	0.75		
Management of Student-Athlete	24	8.00	0.67		
	25	7.20	0.72		
	26	7.40	0.62		
	27	9.00	0.75		
	28	8.60	0.72		
	29	7.80	0.65		
	30	7.20	0.72		
	31	8.60	0.72		
	32	8.60	0.72		
	33	8.60	0.72		
Sport Science Services	34	7.20	0.72		
	35	7.40	0.62		
	36	7.40	0.62		
	37	9.20	0.77		
	38	9.00	0.75		
	39	8.00	0.67		
	40	9.00	0.75		
Welfare	41	7.40	0.62		
	42	8.60	0.72		
	43	8.80	0.73		

Specifically, the results of analysis showed that the percentages of consensus for the nine support elements were larger than 75%, which is 88%. These nine support elements were financial support, family support, peer support, institution, and faculty, management of student-athlete, sport science services and welfare. This data consists of the threshold value, overall item percentage, average of response and fuzzy evaluation.

Conclusion

As a conclusion, Fuzzy Delphi Technique can be considered as an effective method to determine the constructs of a variable that based on the level of consensus among the experts. Fuzzy Delphi Technique consists of six basic steps, namely, selection of experts, linguistic scale selection, compute thee average value, calculate the threshold value, and determine the consensus of experts and lastly defuzzification process. The most important is the use Fuzzy Delphi Technique may significantly reduce time consumption on the questionnaire and save cost. In the other result aspect, the importance of element supports from environment aspects in providing support in order to enhance academic achievement on student-athlete's public institutions of higher education cannot be denied. Academic achievement become the benchmark to rate of dropout students in Higher Education Institution. This study is important to the top management of university in addressing the problems of academic achievement student-athletes in an institution of higher learning.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Non-Muslim Consumer Perspective on Cosmetics and Personal Care Products

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Abstract

Majority of non-Muslim society believes that Halal is meant for Muslim only. Since they don't have sufficient knowledge and awareness about halal products, the benefits of it is not well appreciated. After all, most of the company didn't focus on non-Muslim market. The aim of this paper therefore is to determine the factors affecting purchase intention of Halal personal care products among non-Muslim consumer. Data was collected in Penang of 240 non-Muslims via structured questionnaire to gather information on their perspective towards Halal personal care products. Multiple Regression Analysis is applied to determine and assess the strength of relationship between variables. The factor that influences the purchase intention of Halal cosmetics and personal care products is halal awareness, religiosity, halal certification, attitude and brand trust. The result of the study suggest that brand trust strongly influences the purchase intention of Halal cosmetics and personal care products. Companies targeting non-Muslim markets are therefore are encouragedto tailor their marketing activities based on a behavioural perspective which increases and benefits social expectations and awareness which in turn would enhance their competitive advantage. By strengthening the brand trust through Halal process standard in production of guaranteeing hygiene and quality will allow products to penetrate into new market of non-Muslim consumer.

Keywords: *Personal Care, Purchase Intention, Halal.*

Introduction

When it comes to Halal, food is always associated with it. However, the scope of Halal covers a lot more than just food. From banking to health care, tourism to cosmetics and personal care products, there is a whole lot more of halal products or services offer in the market. Perhaps the misconception of Halal is when products or services offers misunderstood as it servessolely for the use of Muslims consumer. Nowadays, Halal is not limited only to Muslims, but non-Muslims also adapt and practice in their everyday lives.Halal is not limited to Muslim only but it also a choice for non-Muslim worldwide[1].

Halal is an innovation to all products because it is way more hygiene and safe to be used. The Halal product contains no dangerous and harmful ingredient. To manufacture halal products, manufacturer has to adhere with stringent manufacturing process standard which follow the Islamic rules. The process must comply with the standard quality and hygiene aligned with Good Manufacturing Practice (GMP). From selecting raw ingredients, the process of making the products, storage, display and delivering the products must conform with the Islamic law. Therefore, for non-Muslims, Halal can become a mark of unquestioned conformance and quality in trade dealings with Muslims[2].

The Halal industry in Malaysia had a rapid growth in not only healthy lifestyle but also in other life activities. Therefore, manufacturer and entrepreneur must come out with a fresh and new idea in developing a variety

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of Halal products that can be used not only Muslim but also non-Muslim. In order to ensure non-Muslim also buy a Halal product, the companies need to convince and create awareness in their community.

In Malaysia Budget 2019, the government has stated that they will focus more on halal industry where the government will allocate 100 million ringgit to improve the capacity of small and medium-sized enterprises in the halal industry through different programs to increase exports and make Malaysia as a global halal hub by 2020.

Non-Muslim society has yet to appreciate the underlying benefits of Halal products that include a hygienic process[1]. Before reaching the market, Halal products must be subjected to them. Today, the trends in the purchase of cosmetic and personal care products are increasing every day. Consumers nowadays are expecting products that are not harmful to them. Therefore, the market can be expanded to new market category by tapping into non-Muslim market as their awareness of Halal is high[3].

Literature View: Halal in Cosmetics and Personal Care: The word Halal originated from an Arabic word "HALLA" which indicate "allowable" and "not forbidden" to all Muslims to consume or practicein their daily lives. In general, halal products do not contain pork, alcohol, blood or additives of animal origin and throughout the entire production process, they are not contaminated with said ingredients. Halal nowadays is a universal concept[1]. Non-Muslims also believe they should not buy or use an animal-based product due to concern over animal abuse and harmful effects. The cosmetic and personal care products segment has emerged as one of the leading market segments. Halal beauty industry has grown tremendously especially in the halal pharmaceuticals and cosmetics sectors which continue to expand[4].

Halal Awareness: Awareness is the ability to perceive events and objects, to feel and to know. It is a concept of understanding and perceiving events and subjects[5]. Awareness was assumed to be an important part of determining the intention to choose halal product and personal care.

One of the main issues for consumers is the difficulty in securing legal status for imported cosmetics because they do not have halal certification where these halal cosmetic products are generally welcomed by Muslims and attract non-Muslims to consume of cosmetic products[6]. The growing awareness of non-Muslim users about their religious obligations calls for personal care and Halal cosmetics. Some consumers are aware of cosmetic products, so they bought more reliable and safer cosmetic products[7,8].

Religiosity: Most people in this world have shown that religions are one of the most influential roles in shaping the choice of food among the members of societies.Religion is not an important factor in consumption of the product, but someone religious known as religiosity is vital on shaping one's purchasing behavior.Such religious commitments and beliefs would certainly have an effect on people's feelings and attitudes to buy and consume[9,10].

Halal Certification: Halal certification means the official recognition by the established body of the orderly preparation, slaughter, cleaning, handling and other relevant management practices[5]. Interestingly, the principle of halal is more than it was, because both Muslims and non-Muslims accepted it broadly. The Halal concept is considered the preferred standard for these two groups globally[1].There is no other way to determine the "halalness" of a product except by using a credible Halal logo[11]. This is because the halal certificate is only issued if it complies law and proper requirements and these organizations have the authority to certify that the products are halal and have the infrastructure[12].

Attitude: It is worth noting that the product focuses not only on halal status but also on safe and clean products that are used as ingredients in the production of the cosmetic and personal care product based on natural resources[7]. Consumers place their trust in information obtained from sources, especially when it comes to religious authorities. With a wide variety of beauty products, consumers may not know what they have taken or used on their skin and some will mislead the consumers[13]. Furthermore, theaccessibility of a product in some places may alter its attitudes towards buying a good cosmetic product[8].

Brand Trust: Brand trust refers to the feeling of being secure between consumers with their trust in certain brand. Consumer belief the brand can be dependable and accountable for their well-being[14]. Through the Islamic belief system, product strength is associated with the production process, quality control and environment can attract the interest of consumers to purchase and use

Halal cosmetic and personal care as non-Muslim start to put their confidence on that brand[15].The trust level was low if the brand was not known[16]. This also applies to non-Muslim Malaysian consumers, where trust in the brand determines the level of trust in the product's halal status[5].

Theoretical Framework: Consumer tends to make a presumption before deciding to make prior to decide when making a purchase. Organization doing internal audit function will be more effective to detect and to report that there is fraud in organization[9], and accountancy fraudulence tendency can be led down by to increase an internal controlling effectiveness, accountancy role loyalty, management morality, and to eliminate information asymmetry[4].

Based on the above, the research framework adapted from can be described as:

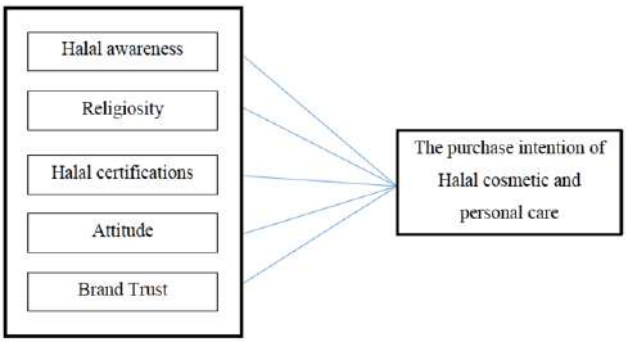

Figure 1: Research framework

Methodology

To achieve the aim of this research, explanatory method is chosen. Questionnaire is constructed based on research framework. About 240 non-Muslim participated in the survey to collect relevant data. The statistical tool used in the study is multiple linear regression to test the relationship between variables.

Results and Discussion

The R^2 is valued at 0.634, which the purchase intention is explained by 63.4% by all five independent variables. In this study,four independent variables (religiosity, Halal certification, attitude and brand trust) are making a statistically significant contribution to equation ($p<0.05$) with p-value 0.000, 0.000, 0.021 and 0.00 respectively.From the analysis it is found that out of the five variables, all are significant except for Halal awareness.

The p-value of Halal awareness resulted a 0.778 valueoutput which is not significant. This result is supported by another research which stated that among Muslim women in Klang Valley, the level of Halal awareness towards Halal cosmetic is still low which also shows that non-Muslim level awareness is low as well. Halal awareness is a major factor in explaining in non-Muslim societies the interest to buy halal product[5,17].

Conclusion

In this research, brand trust variable is the most influential towards purchase intention on Halal cosmetic and personal care rather than other variables which is Halal awareness, religiosity, Halal certification and attitude. The customer will choose the product that they have trust on it. By means of trust, they will purchase a product that have the best advertising or might be influence from their family and friends who has been a loyal customer towards certain brands. Therefore, the Halal companies and government should focus on designing a good product that include safe ingredient and trusted manufacturer so that it can attract the interest of non-Muslim to purchase and used the Halal product.

Next, implication of the research is Halal awareness which has the least influential towards purchase intention on Halal cosmetic and personal care. This research shows that majority of the respondent being ignorance about the Halal when purchasing a cosmetic and personal care. For them, Halal is not the priority when choosing the product. This also shows that the level of Halal awareness is still low among non-Muslim. Therefore, the companies and government must implement many activities and program such as talk, Halal exhibition by spreading the benefit of choosing Halal cosmetic and personal care. From that it will increase the exposure of Halal and attract their interest to get know more about Halal product.

Recommendations: To overcome the limitation of this study, there are some recommendation proposed by the researcher. This study covered respondents from a state in Malaysia only, because of that it is recommended for further study to collect the data from all states. From that, it will help the researcher to make a comparison on the behaviour of the consumer in intention to buy Halal cosmetic and personal care. The researcher also needs to cover the sample towards all areas in Penang to ensure be comprehensive and represent more population.

Lastly, this research only used five variables in

measuring the intention of non-Muslim in purchasing the Halal cosmetic and personal care. It is suggested to future researcher to used additional variable such as knowledge and quality that will provide more information about this study.

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Students' Pro-Eco Behavior Related to Healt Based on Environmental Big-Five Personality and Self-efficacy

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Abstract

This research was aimed at finding out whether students' pro-eco behavior could be predicted by their personality and self-efficacy interms of a correlational study. A survey method was used involving 200 senior high school students in Jakarta. The reliability of three instruments were respectively 0.75 (pro-eco behavior), 0.87 (big-5 environmental personality), and 0.66 (self-efficacy). Regression and correlation analysis were used. Results revealed that both personality and self-efficacy have a positive and highly significant correlation with students' pro-eco behavior, even for first-order correlation. Multiple regression model for those variables was also found highly significant. Therefore, it could be concluded that student's pro-eco behavior could be strongly predicted by personality and self-efficacy and in strengthening students' pro-eco behavior, their personality and self-efficacy could be taken into account. Considering the results obtained, it was suggested to teachers, who held an important role in the learning process, to understand students' personalities by paying attention to identifying students' personalities. It is important also to spontaneously carrying out a kind of parents, society, teacher collaboration. In improving students' self-efficacy, teachers were supposed to appreciate students which finally would strengthen students' pro-eco behavior to be more positive and students healthy could be achieved effectively.

Keywords: *Personality, self-efficacy, pro-eco behavior, reliability, and first-order correlation.*

Introduction

Environmental issues have been the most influential topics in any country. It has an effect also on economic development where most countries should prepare a green trade by adopting eco-labeling products. Sustainable development is not the answer since it is still admitted that in some places, environmental destruction, degradation, deforestation, and even global warming are not an illusion. Talking about the environment, we also talk about human health which of course influenced directly by the environment. If we love our-self meant that we should also our healthy and automatically we love our environment as well. These phenomena called pro-ecological behavior.

The ecosystem consists of producers, consumers, and decomposers (Barrow, 2006).[1] Chiras (1991)[2] called a sustainable society characterized by human behavior which might be more concerned with the environment (Putrawan, 2015).[3]

Environmental behavior,which specifically called pro-environmental behavior or pro-ecological behavior (PEB), was a similar term used interchangeably, however, according to Kollmuss & Agyemen (2002),[4]it was a complex concept which still questionable what factors shaped pro-environmental behavior. It has been identified some factors such as demographic factors, external factors (e.g. social, cultural, institutional, or economic) and internal factors (e.g. knowledge, attitudes, locus of control,awareness, emotion, values, responsibility) might be used in visualizing its framework.

That is why, this research is so important in predicting pro-ecological behavior,by questioning whether student's personality and self-efficacy could be beneficial contributions in framing scientifically the concept of pro-ecological behavior.

Literatures Review: The behavior will influence the environment and conversely, the environment affects

behavior (Bennett, 1974, in Putrawan, 2017).[5]Study about behavior is surprising because of many factors that should be considered in finding out why and how human behavior could be changed. Those factors arecalled the interactionistperspective (Greenberg, 2010)[6] which consisted of personal qualities and situational (setting, context, environment) influences.

In the context of research, human behavior should not be directed to thementality frontier, a term borrowed from Chiras (1991).[2] It should be directed to behavior that has perception toward the environment by protecting the ecosystem from destruction for future generations (Blackwell, 2007)[7] This type of behavior belongs to Chiras (1991)[2] was called a sustainable society.

According to Baker (2012),[8] environmental behavior is indicated by energy used efficiently, as well as water and other resources, and reducing waste, pollution, and environmental degradation. Garrod & Wilson (2003)[9] stated that human environmentally sound behavior was characterized by conservation, recycling or use-reuse,utilizing more renewable energy resources, and limiting growth. Related to these indicators, Marcinkownski (1989)[10] described that human behavior should be directed to the utilization of natural resources rationally.

A more detail model contributed by Hines, et.al. (1986)[11] wasmodified by Blaikie (1993, in Oram, 1994, p.32)[12] in which human behavior called Responsible Environmental Behavior (REB).It hypothesized that REB was affected by factors such as attitudes, locus of control, personal responsibility, knowledge, personality, situational factors, and intention to act. In addition to this, Wayne (2006)[13] added that there were three types of responsibility, personal, social and environmental responsibility

Related toREB, the Hines' model, quoted also by Kollmuss & Agyemen (2002)[4] elaborated into a complex model called citizenship behavior (Hungerford, 1990)[14] affected by entry-level variables, ownership variables, and empowerment variables.

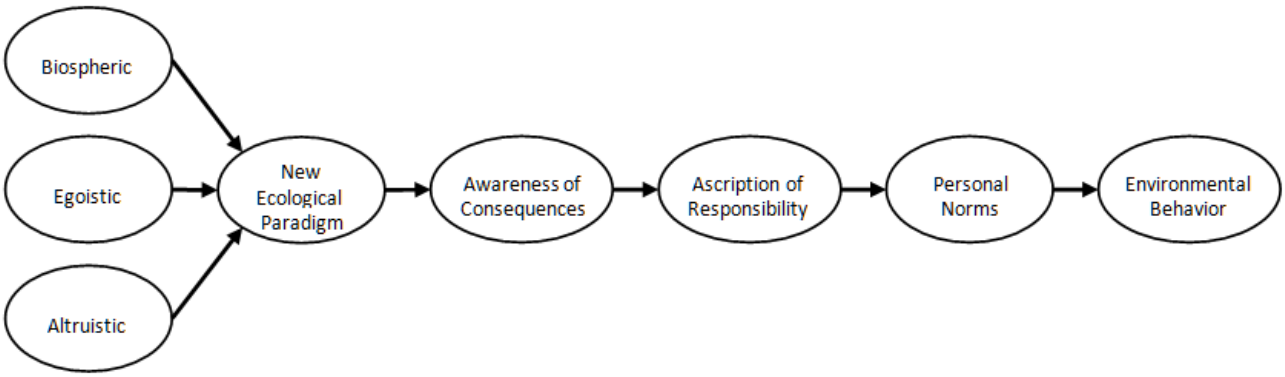

Fig 1. VBN model for environmental behavior (Stern, 1999 & 2000 & Bronfman, et.al., 2015)[15,16,17]

The Values-Belief-Norm (VBN) model was also widely used for the study about the relationship between as many as independent variables with environmental behavior which those relationships kept remaining statistically significant (Bronfman, 2015).[17]

According to Stern (2000),[16] "Pro-environmental behaviors are generally defined as behaviors that reduce the environmental impact caused by human beings." Such behaviors are covering e.g. saving energy and reduced consumption of resources, the efficient use of motor vehicles, and natural conservation (Steg & Vlek, 2009).[18]

Eventhough "an individual's pro-environmental behavior might create only a small impact on easing environmental destructions (Stern, 2000, in Kaida & Kaida, 2017).[19] That is why, this research is very urgent to be carried out, whether student's pro-ecological behavior (PEB) could be predicted by their personality and self-efficacy.

With that perspective in mind, students' personality contributes to the responses shown in the learning situation.Working together in a group needs the ability to communicate, share ideas, and transfer knowledge and skills, and to maintain a strong pro-eco behavior.

The motivation as indicated by self-efficacy must be driven by conscientiousness traits. As stated by Judge and Ilies (2002)[22] that conscientiousness is associated positively with the motivation to achieve.

Self-efficacy is another factorrelated to pro-eco behavior. Self-efficacy is the confidence to execute the assignments given to someone. According to Santrock (2011),[23] self-efficacy is the confidence to say "I can."

This statement has been previously supported by Hines, et.al. (1986/1987)[11] which found out that there were six studies specifically dealt with relationship between individual locus of control that was an individual's "efficacy perception,"with responsible environmental behavior.

Researchconducted by Werff, Steg & Keizer (2013)[24] suggested that "strengthening environmental self-identity may be a cost-effective way to promote pro-environmental actions, because environmental self-identity is closely related to self-efficacy.

Reported by Tabernero & Hernandez (2011)[25] that "the was arelationship between self-efficacy and recycling. In this study, recycling is part of individual's pro-ecological behavioror just citizenship behavior asused by Hungerford & Volk (in Putrawan, 2017).[5]

Fransman & Timmeren (2017)[26] foundthat pro-environmental behavior could be predicted from behavioral control, behavioral norm, and place identity, explaining 40% of the total variance in pro-environmental behavior.

Gifford & Nilsson (2014)[27] stated that to understand pro-environmental concern and behavior is very complex and complicated than previously thought. They have successfully identified around 18 factors that were assumed to be factors that could be used in predicting individuals' pro-ecological behavior such as "the personal factors include childhood experience, knowledge and education, personality and self-construal, sense of control, values, political and world views, goals, felt responsibility, cognitive biases, place attachment, age, gender, and chosen activities.

Research Methodology: This research was aimed at finding out whether there was a relationship between personality and self-efficacy with pro-eco behavior. The survey method used by involving 200 senior high school students in Jakarta.

There were three instruments developed to measure personality with reliability was 0.87, reliability for self-efficacy was 0.66 and for students' pro-eco behavior was 0.75. Data analyzed by simple and multiple regressions, and t-test for correlation after followed by calculating its second-order correlation through ANOVA.

Results and Discussion

Analysis has been conducted by computing simple regression model which found that the model between personality and student's pro-eco behavior was $\hat{Y} = 28.45 + .43X_1 (p < .001)$.

Table 1: ANOVA Table for Regression

Source of Variances	df	SS	MS	F_{cal}	F_{table}	
					.05	.01
Reg (a)	1	49956.08	49956.08		3.84	6.63
Rg (b/a)	1	3693.55	3693.55	44.88**		
Error	198	16295.16	82.29			
Total	200	519584.08				

** p <0.01

Based on the table 1, it could be interpreted that the strength between personality (X_1) with pro-eco behavior (Y) was shown by the correlation coefficient was 0.816 (p <0.001).It meant that the more accurate personality, the stronger pro-eco behavior would be.

The determination coefficient was (0.816^2) meant that 66.61% of pro-eco behavior variance could be explained by personality variation. By controlling another variable was to determine the level of relationship between given predictor variables (while another predictor variable was

controlled). The result of the partial correlation between personality and pro-eco behavior (first-order correlation) while self-efficacy was controlled, was0.629 ($p < .001$).

Luthans, et.al. (2011)[21] stated personality was how someone influenced other people and how he viewed and understood himself, including the pattern of traits which could be measured from how he interacts with people and situation around him. Personality can be divided into five dimensions. Extraversion, agreeableness,cons cientiousness, emotional stability, and openness to new experiences (George & Jones (2012).[20]

Regarding neuroticismstudents could be stress-out, tense, and depressed in different situations. It makes students face difficulty to maintain their pro-eco behavior. This unstable can cause the feeling to give up (McShane & Glinow, 2018).[28]

Conscientiousness will reflect the persistence to achieve the goals. Proved by an international journal regarding predicting pro-eco behavior based on personality that each dimension of personality contributes to pro-eco behavior. However, her research result showed the different coefficient correlation between each dimension with pro-eco behavior. This fact proves that it is undeniable that personality contributes positively to pro-eco behavior (Ariani, 2013).[29]

Personality's contribution to pro-eco behavior found was 0.66. Statistically, this value meant that 66.61% of pro-eco behavior variation could be explained by personality variance. Therefore, personality was a factor that was essential in strengthening students' pro-eco behavior. Partial correlation between personality and pro-eco behavior, self-efficacy was controlled 0.629 meant that its determination coefficient was 0.395. The result showed that 39.56% of pro-eco behavior variationcould be explained by personality variances by controlling self-efficacy.

Another finding was the regression model of $\hat{Y} = 39.39 + 0.21X_2$ ($p < .01$) between self-efficacy (SE) with pro-eco behavior (PEB).

Table 2. ANOVA Table for Regression

Source of Variances	Df	SS	MS	F_{cal}	F_{table}	
					0.05	0.01
Reg (a)	1	499947	499947		3.84	6.63
Rg (b/a)	1	905	905	9.41**		
Error	198	19048.67	96.21			
Total	200	519900.7				

**$p < 0.01$

Based on the table above that the regression model pro-eco behavior (Y) with self-efficacy (X_2) was linear. In other words, there was positive relationship between self-efficacy and pro-eco behavior. This regression model meant that if self-efficacy was increased a point of pro-eco behavior will rise .21. The strength of relationship between self-efficacy (X_2) with pro-eco behavior(Y) was shown by correlation (r_{x2y}) = 0.674 ($p < .001$). In other words, the higher the students' self-efficacy, the more positive students' pro-eco behavior would be. Determination coefficient was (0.674^2) meant that 45,40% of variance occurs in pro-eco behavior could be explained by self-efficacy.

Self-efficacy, which is the center of Albert Bandura's social theory, is the individual's confidence to execute a task efficiently (Campbell & Nelson, 2013).[30] Self-efficacy is gained from personal experiences when an assignment can be fulfilled effectively or being able to get back up from failures.

In this research, the partial correlation between self-efficacy and pro-eco behavior was0.111 and the determination coefficient was 0.0123. This meant that only 1.23% of pro-eco behavior variation could be explained by self-efficacy when the personality was controlled. These findings aligned toZimerman, Bandura, and Martinez-Ponz's (1992)[31] findings which self-efficacy will motivate academic achievement by affecting personal goal setting. Statistical test analysis showed that self-efficacy contributes significantly to pro-eco behavior, where the higher self-efficacy, the more positive of students' pro-eco behavior would be.

The multiple relationship strength found between personality and self-efficacy with pro-eco behavior was 0.819 ($p<0.001$), indicated by the correlation coefficient of personality and self-efficacy with pro-eco behavior. The determination coefficient was (0.819^2)which meant 67.03% of students' pro-eco behavior variances could be explained by personality and self-efficacy. It was around 67.03% asthe percentage of personality and self-efficacy contributed to pro-eco behavior, the rest would be determined by other variables.

This conclusion meant that the relationship between both personality and self-efficacy with pro-eco behavior was positive, which meant that the more accurate personality and the higher self-efficacy, the more positive students' pro-eco behavior would be.

Conclusion

Based on the research findings, it could be concluded that, first, there was a positive relationship between personality and student's pro-eco behavior. Second, there was a positive relationship between self-efficacy and students' pro-eco behavior. Finally, there was a relationship between both personality and self-efficacy with students' pro-eco behavior.

Therefore, the more accurate the students' personality and the stronger self-efficacy then the more positive pro-eco behavior would be. In other words, students, in this study students' pro-ecological behavior could be predicted by their environmental personality and self-efficacy, Therefore, if students' pro-ecological behavior would be improved to be more positive in facing global environmental problems, their personality and self-efficacy could not be neglected. It would be suggested that environmental education is very vital required to be implemented urgently and could be integrated into several subject matters by intervened with morale messages.

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Visualization Program of Practical Work Manual for Biology Concepts on Health Education Topics

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Abstract

Science practical work has to be carried out with due regard to the availability of resources and has to facilitate student learning, but in accordance with the instructional goals. A practical work manual need to be supplemented with relevant visualization programs in order to improve students' understanding of practical work on health education topics. The objectives of the research were to identify practical topics that need visualization programs and to develop an example of a visualization program for the practical work. The results of the research were models of visualizing practical work procedures in biology on the topics of health education. The study carried out using the design of qualitative research method. The source of data and information consisted of five lecturers and sixteen students of the Biology Education Program. The instruments consisted of focus group discussion, interviews, document analyses, questionnaires, and test. The results indicated that practical works manual require programs to visualize practical instructions that students must undertake. The visualization programs are to provide a more detailed explanation of the components of the topic discussed, such as in the respiratory system, to provide a detailed description of the procedures that must be carried out, for example in practicums of measuring respiration rates, and to detail observations, for example in practicums of the sex determination of fruit flies. In addition, the results specified that in the development of programs that visualize practical instructions and biological concepts could use the Dick & Carey Systems Approach Model for Designing Instruction. The programs are to increase students' understanding of practical work and towards the content discussed. However, further researchs need to conduct in order to explore and analyze the level of student understanding.

Keywords: *Visualization, practical work, practicum manual, biology-concepts, health education topics.*

Introduction

The main objectives of practical work in biology, espeially on health education topicts, are: to teach science concepts, subject materials, and the nature of science; to develop skills and techniques for scientific procedures; to enhance scientific literacy; to increase motivation and interest; to develop social skills, and; to provide support in applying the knowledge in everyday.[1, 2,3]Practical skills among others, can be in the form of physical skills, such as measuring, observing, experimental design, data management, and other psychomotor skills; as well as the skills to think and use logic, such as making inferences, choosing appropriate method and identifying regularities of nature, and problem solving.[4] Concerning the types of activities, practical work that could be carried out, includes practical observation, experiment, and investigations.[5,6]

Practical work is still considered to face some problems in terms of task and activity characteristics, relevancy of assessment, implementation support, and adequacy of resources, time, and facilities.[7,8,9] Open and Distance Education copes with similar issues.[10,11] Improved learning outcomes in science, including biology concepts on health education topisc, can be achieved by: creating learning materials that are more concrete; placing learning materials in a realistic context;

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providing practical experience in the method of science and with scientific instruments; improving observation skills; fostering cooperation and roles in the team; developing a positive attitude about the outside world, and; gaining knowledge of the natural relationship with the community, especially with regard to the use of resources.[1]

In order to promote learning and understanding and to aid in analysis and problem solving in science, Vavra, *et.al* proposed recommendations for providing visualization objects, interpretive visualization, and animations and computer-based visualizations.[12] Scientific visual and visualizations include dynamic multimedia demonstrations of principles, animated explanations and manipulable three-dimensional images.[13,14] Vavra, *et.al* indicated that the visuals are used as a supplement to text, in addition animations are used to explain concepts that can't be seen, to explain movement, to figure three-dimension concepts.[12]

The Undergraduate Program of Biology Education at Universitas Terbuka (UT), the Open University in Indonesia, considered that the existing Practical Work Manual needed to supplement visual programs, especially in order to enhance student understanding in conducting practical work in health education topics. An alternative form of supplements is a visual of the explanation that describe and discuss in the Practical Manual. The visual program refers to the process of creating a graphical representation or is a synonym for visual imagery.[12]

The research problems consisted of (1) what are the topics of practical work procedures that most need visualization supplement, (2) what are the topics of practical work procedures that are most likely to be developed, (3) what are the steps required for program development, and (4) how do students perceive the visualization program. The objectives of the research were to identify practical topics that need visualization programs and to develop themodel of visualization program.

Reaseach Methodology: The research design was based on qualitative research method, and Research and Development (R & D).[15] Procedures of product development followed the Dick, Carey & Careymodel.[16]

The study carried out in Tangerang Selatan, Indonesia. The sources of information were 5 experts in biology education and 16 students of the biology education program who did practical work in. Data collection consisted of focus group discussion, interview, document analysis, a questionnaire and a test. Focus group discussions and interviews to experts and students were carried out in order to identify topics of practical work manuals that require visualization programs. The researchers developed visualization programs of respiration rate, fruit flies sex determination, and flower diagram model. The experts expressed their oppinion regarding content of the visualization programs. The students filled questionnaire, took the test and gave their oppinion reagrding the content and quality of the program and their understanding. Collected dataand information were analyzed descriptively.

Results and Discussion

The results of student focus group discussions and the results of experts' reviews indicated the practical work manual required additional visualization for the procedures, and additional explanation. Both the students and the experts determined that visualization was needed for the topics of: (1) measuring respiration; (2) osmosis and plasmolysis; (3) photosynthesis; (4) identification of bacteriaand fungi; (5) blood type examination, (6) reproductive system, (7) fruit flies sex determination, (8) microorganisms in life (e.g rhizopus, aspergilus), (9) desinfectants in environment, (10) diagrams of flowers, and (11) motion of heart tendons.

The results showed generally that practical work that needs lab equipment and the guidance of the instructor requires additional explanation or visualization. Some practical work was considered to be able to be simulated through a drylab program. The experts recognized the most suitable practical work that could be substituted with simulation programs. However, the students argued that they have to do all the practical work and thus they recommended that it not only be demonstrated through simulation. Furthermore, the practical work topics of frog cardiac muscle motion, and determining male and female fruit flies could be given to students as simulations (drylab program).

Development of visualization programs follow the procedures of the Dick, Carey & Careymodel.[16]The initial idea of the study was to consider the need for other media provided to clarify the practical procedures listed in the Manual of practical work in biology. Students and experts have reviewed and analyzed the topics that required additional explanation.

The prototype consisted of a visualization program in the form of an interactive power point. In order to improve the programs, through a Focus Group Discussion, five experts assessed the prototype visualization programs. The expert assessment indicated that the program neededrevision, especially for (1) instruction, illustration, and proceduresof measuring animal respiration program, (2) illustration, feedback, and discussionof fluit flies sexdetermination program; and (3) images and consistency of terms for flowerformulas anddiagram program.Results of the *one to oneevaluation* showed that the draft prototype needed to be refined in terms of procedures and explanations of the practical results and the assessment, especially for the topic of measuring respiration rate of animals, and the symmetry and formulas of flowers.

The next stage was to evaluate and try out the draft of prototype by a small group of nine students. Students' perceptions regarding the practical work of measuring respiration rates showed that program animation or simulation were insufficient to support their work in carrying out observations and writing reports. Content and display programs hadtorevise. Furthermore, students can conduct the practical work of determination of fruit flies sex. The content and appearance of the program is good enough so that the program does not need to revise. The students consider that animation program of the flowers diagrams had to revise, especially concerning the explanation of content and the images of program. Students stated that to providebetter, attractive, and natural photographs of flowers.

After reviewingthe practical work Manual and watching the program, students have had the test to measure their understanding of the practical work and the content. The analysis showed that the students have a good understanding of the procedures and content delivered via the visualization program practical work for determining fruit flies sex, and show sufficient understanding of the procedures and content of the practical work for animal respiration rate and flower diagrams.

Visualization is required to convey complex concepts or data, abstract concepts, interrelationships in a system, a scientific explanation that cannot be found in everyday life, and certain processes that occur at the microscopic level.[13,1,14]Conceptually, visualization can be visualization objects and introspective and interpretive visualizations. Thus, visualization can be physical objects, mental objects, and cognitive processes that involve the interpretation of physical or mental visualizations.[12]A visualization laboratory considers tosupport explain, develop and teach the concepts being studied. For example, clarification of practical procedures, clarification of how to manipulate the equipment, observation techniques and types of recording results. The visualization could be a representation or description of a process or activity or skill or results or object or shape of the image, and then the object can be image visualization, three-dimensional models, schematic diagrams, geometric illustrations, through computer modeling, simulation, animation, video.[13,1, 14, 12]

Program visualization of practical work becomes important for students who are learning in the open and distance education system. In this learning system, the learning process will run more smoothly and significantly when utilizing a variety of instructional media. In terms of practical activity, distance education learning tends to use a variety of technologies and media and it is an attempt to restructure the relationship of students with learning resources.[17]Distance education learning leads to the use of computer and computer -based learning.[18,19]The effects of computer simulations in science education are caused by interplay between the simulation, the nature of the content, the student and the teacher.[20]

In this research, the visualization program created as an additional explanation is not in the form of practical simulations or replacements. Kennepohl argued that the types of practical work for distance education systems could be both wet and dry lab practical work.[10] The type or form of practical work could be hands-on, simulation programs, remote labs, virtual labs, and real practical work (practical work in labs or the field).[1,2]

Indeed a visualization program is not a solution to everything. However, the effort and method to provide visualization are expected to enhance students' understanding, the quality of teaching, and student learning.[21]. A visualization program consider to enhance the students' understanding of practical work that ultimately mayimprove various things like understanding of concepts, problem-solving skills, scientific thinking habits, skills, attitudes, interests and motivation of students. In line with the opinion of Rundgren & Bao-jun[21], the determination of the visualization should be linked to the characteristics of the content and not give rise to misconceptions.

Conclusion

The visualization program for practical work is required in order to clarify the description in the practical work manual. The program would provide a more detailed explanation of the components of the topics discussed, for example in the practicum of the respiratory system, reproductive system, and flower diagrams. In addition, the programs could provide detailed description of the procedures, for instance in practicum of respiration rate, osmosis and plasmolysis, heart muscle motion. Furthermore, the programs could provide detail observations, on the case of practicums of bacteria and fungi identification and disinfectant levels in the environment. Development of visualization programs could use the Dick & Carey Systems Approach Model for Designing Instruction. The programs should be attractive and could facilitate student learning. Relevant studies are required to analyze the level of students' understanding by involving more students in the study.

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Effects on Memorized Information Quantity in Web Pages Using Bicolor Design-from the Perspective of Color Blind People and Non-Color Blind People

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Abstract

In Japan according to the Japanese Ophthamlogical Society, people with color blindness make up about 5% of men and about 0.2% of women. Colorblind people often experience inconvenient situations in their lives because they cannot distinguish colors. Web pages are no exception. Companies and governments use web pages to transmit information to people. In this study, we created a web page with a color scheme obtained from previous research. This study confirmed that colorblind people, after viewing such a web page, remembered its contents better. From these results, this study analyzed the role of information transmission on the web page. As a result, the viewers color vision and hue of colors on the web page had no effects on their memory. The result also showed that the color of high chroma on the web page had no effects on their memory. The result also showed that the color of high chroma had bad effects on their memory.

Keywords: *Web Page, Color, Memory.*

Introduction

Society of Web: The Internet is one of the most pervasive media. On the Internet, Web sites play a major role in information technology. Web sites are pervasive in modern society. Producing a widely accepted Web site leads to the smooth transmission of information to many people. By improving the quality of the website, you can communicate your information more widely and accurately, and at the same time, you can show improvement in the evaluation from others.

The purpose of creating a website is to communicate. When websites are used, first they are read by readers. Next, the information on the websites is fixed as memory. Finally, people output it as information. We get a large amount of information. People judge that information is important to them, and consciously interpret and remember information. We can quantify communications from the internet to measure the amount of memory.

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Existence of Color Blindness: Webpages transmit information through the viewer's vision. Therefore, we mustn't forget the existence of colorblind people when we design webpages. Colorblind people are those who have difficulty recognizing certain colors. The crystalline lens is in the eye. The light from the lens is reflected onto the retina, which acts as a screen. The cells of the eye recognize the color. It has three cone cells: red, blue, and green. Colorblind people do not have these cones, or their cones don't function normally. As a result, they can't discern colors. The Japanese Ophthalmological Society classifies Common, Protanope, Deuteranope, and Tritanope depending on which cell cone doesn't function. Protanope accounts for about 25% of colorblind people in Japan, while Deuteranope accounts for about 75%. Tritanope are colorblind accounts for less than 1%. Around 1 out of 20 males are colorblind, and around 1 out of 500 females.

Color Universal Design: Color universal design is used when we make products for both colorblind and non-colorblind people. Guidelines have been published

by various municipalities to people who make use of color universal design. Major examples include the "Tokyo color universal design guidelines" published in Tokyo, and the "Guidelines for using colors that consider people with color blindness" published in Osaka. The social opportunity promoting the consideration for colorblind people increases year by year. Websites are also similar. According to the "Tokyo universal design guideline", they recommend adjusting brightness, saturation, and so on. According to the "Guidelines for using colors that consider people with color blindness", they recommend only to make adjustment in brightness. It is also indicated that we should consider the colors of letters and backgrounds. Zhanget al.[1,2] studied the impressions of colorblind and non-colorblind people as they view websites. They made websites using a bicolor design. As a result, the hue reveals differences between the impressions of colorblind and non-colorblind viewers.

The Purpose of This Study: Websites are a medium viewed by an unspecified number of people. We should make websites that consider both colorblind and non-colorblind people, because websites are a form visual information. And the viewer consciously remembers information after viewing it. Previous studies have examined relationships from each aspect of universal color and memory. But there are few studies about websites from the perspective of both universal color and memory. In this study, our purpose is to examine the influence of color websites on the memory capacity of the viewer. We evaluate color universality in the context of Common, Protanope, Deuteranope types of colorblindness.

Experiment 1:

Procedure of Experiment 1: Research participants are third- or fourth-year undergraduates, 38 males and 18 females. They viewed 8 webpages that have different color schemes. They solved a test of webpage contents. The procedure of the experiment is as follows. First, we gathered research participants in one place. Then we divided them into six groups. The research participants who played the role of being colorblind wore glasses that simulated Protanope or Deuteranope. Next, all participants opened the first page of the webpages. They familiarized themselves with the test form by viewing the sample page. After that, participants viewed experimental webpages, solved memory tests, and took breaks in between, repeating this process several times. So as not to allow participants to become influenced by the order of the test, random switch operations were also included.

Experiment 1 Environment and Equipment: This experiment was conducted by collecting research participants in a computer room at A University. Computers and displays are all the same in the room. The screen brightness of displays is also the same. We used Google Chrome to view experiment pages. The site was tested in full screen view. Also, the screen was viewed from the front. In order to simulate colorblindness, Variantor, manufactured by Ito Optical Industry Co., Ltd. was used. These glasses, which may be worn on top of ordinary glasses, can be used by non-colorblind persons to experience vision. We used Variantor glasses that simulated Protanope and Deuteranope colorblindness.

Making Webpages: We used original webpages in the experiment that were produced by us. We did not use a webpage creation tool for production. We created source files such as HTML and CSS directly. We used the source code editor Visual Studio Code for coding and the hosting services GitHub and Netlify as servers. The design of each page on the webpages was the same layout and content, but different in color scheme. One hue was used per page. Webpages change only the tone and clarify the influence of the tone. Therefore, we used the color scheme using two colors as background color and text color. The main hues of the experiment page were red and blue. Red is a color in which a non-colorblind and a Protanope vision and a Deuteranope vision person perceive differently.On the other hand, in blue, the perception of normal participants and those of Protanope vision and Deuteranope vision are performed similarly.

Test: The experimental flow was first determined by random switches. Next, participants viewed the sample page. Then, the experiment page was viewed, followed by the interval, and the memory test, in this order. This flow was performed a total of four times for each participant. The time of viewing each webpage was 2 minutes. The average reading speed of university students is 653 characters/minute with Japanese words[3]. Based on this, in the case of the sentences used in this experiment, it is possible to read each webpage about 5 to 6 times. The interval time was 30 seconds. This was based on the understanding that short term memory can hold information for roughly 15 to 30 seconds[4]. The contents of webpages were a summary of other studies

at A University. Also, we anticipated that familiarity with the order of activity would affect participants' viewing of similar layouts. Therefore, we programmed random switching of tasks for the participants. We made a program to rearrange the "1, 2, 3, 4" sequence with random numbers. Each participant is presented with a random order by clicking on the random switch button on the website. And they answered the test according to this order. The response time of each test was 3 minutes. In the test, important words of the sentences posted on the Web page are extracted. In this format, words are written in blank spaces. The number of questions per test was 20-23. The scoring standard for the test was 1 point for a perfect match to the answer.

Mistakes in Kanji writing, differences in predicate tense, and inconsistencies in the order in which the questions can be answered in an unordered manner are given 0.5 points. In orderto take into consideration whether participants had read the entire sentence and grasped the contents, a scoring standard of 0.5 was made. The score was converted to a score rate before analysis. We created and used content which doesn't overlap with the sentences.

Analysis Method: Concerning the score rate of each obtained page, the analysis of variance of three factors which made color perception, hue, and the tone a factor was performed.The statistical analysis software SPSS Statistics was used for analysis, and the significance level was set to 0.05 or less.

Results of Experiment 1

The results of the analysis of variance of three factors with color perception, hue and tone indicated that the main effect of the tone was significant ($F (3, 150) = 2.817$, $p < .05$), and the interaction between hue and tone was significant.

In the simple main effect test, the simple main effect of the tone on the page of the blue phase was significant ($F (3,150) = 4.47$, $p < .05$).

As a result of multiple comparison using the Bonferroni method, the score rate of Page 2 is significantly higher than the score rate of Page 3 on the blue page, and the score rate of Page 2 is significantly higher than the score rate of Page 4 on the blue page.

Experiment 2

Method: The text put on the webpages and test are different for each webpage, for the convenience of the experiment. We researched how the rate of scores were influenced because of the text put on webpages and the questions on the test. We measured the relative degree of difficulty of test questions on each webpage when color was eliminated. We constructed pages 1 to 4 in white (N9.5) and dark grey (N4). The contents of each page are identical with Experiment 1. Environments were identical with Experiment 1 and Experiment 2 . And research participants are 8 persons.

Analysis Method: Since the texts and test questions for each of the pages 1 to 4 that we made differ from each other, we performed a one-way analysis of variance with the page (Page 1 to 4) as a factor for the score rate of each page.We examined the difference in the score rate due to the text and test questions.The statistical analysis software SPSS Statistics was used for analysis, and the significance level was set at 0.05 or less.

Results of Experiment 2: As a result of the one-way analysis of variance with the page as a factor, there was no significant difference in the score rate depending on the page difference ($F (3, 28) = 0.130$, $p = 0.941$).

Examintions: In this study, we verified how changes in hue and tone of webpages influenced the memory of non-colorblind people and colorblind people. According to our results, the influences on memory depending on differences in the contents of webpages and test questions caused no statistical difference. In addition, the differences in the amount of memory by non-colorblind viewers demonstrated no statistical difference. From results and analyses, the rate of testing between page 2 and page 3 on the blue hue pages is statistically different. And the rate of testing between page 3 and page 4 on the blue hue pages is statistically different on the blue hue pages. First, we focus on these two points. We examine from differences in Munsell value. On page 2 of the blue hue, brightness difference is 4.5, and chroma saturation difference is 5. It's almost the same as brightness difference and chroma saturation difference. It is tone difference is medium. On page 3 of blue, brightness difference is 3, chroma saturation difference is 9.5. It has a color scheme of contrasting chroma saturation. In the comparison between these two pages, the chroma saturation difference of two colors is predicted to influence memory because there is contrasting chroma saturation.The hue of Page 4 in blue is 3 PB. The lightness difference is 3.5, the saturation difference is 7.5.The coloration is of a somewhat

higher degree of saturation. Color saturation tends to be lower on Page 4 than on Page 2.Similar to Page 3, the magnitude of the saturation difference is considered likely to adversely affect the storage capacity.

On the other hand, we thought that other factors intervene by changing the tone and the result reflected in the ease of memory.A possible issue is visibility: the change in the appearance of the reader alters the character's visibility, and as a result the reader's reading frequency may increase or decrease, and the memory retention rate may differ.

Nakayama et al.[5] found that the sense of saturation of the Munsell color system and the color difference perceived by humans are uniformly located at 2.5 PB, in consideration of the saturation difference.The same phenomenon is considered to occur because the blue used in this study is 3 PB.

In addition to this, the perceived color difference as the actual saturation interval in 5R tends to show that the perceived color difference becomes relatively small, from around 9 to high saturation, and this tendency is a region of high saturation of 9 or more. It is suggested that the equal pace characteristic breaks down.

Sasa et al.[6] state that on a three-color display screen, not increasing the saturation of any color suppresses the perception of unnecessary areas of color and makes the screen easier to see.

In other words, we thought that if the presence of a highly saturated color is placed in the background, it will interfere with the perception of the character part that needs to be memorized and the page will be difficult to see.

Saito et al.[7] show that in the case of a white background, the larger the contrast between the text color and the background color, the higher the visibility.

However, they said that even if there is too much contrast, it should be taken into consideration that eye fatigue is likely to occur.

Katayama et al.[8] suggest that a high saturation background color and negative image display may reduce visibility and readability when viewing a screen, even in color schemes that have differences in lightness that conform to international standards.

From these facts, there is a possibility that the saturation difference affects the memory capacity of the reader of a web page with a two-color scheme where the text color and the background color are mutually different.

At that time, it is conceivable that the change in visibility affects readability by interposing a high saturation color, so except for the high saturation color, by setting the color saturation difference to be moderate, a healthy person can realize easy-to-see Web pages for people with color weakness.

Conclusion

We examined the influence of the color scheme of the Web page on the memory capacity of the reader from the viewpoints of those who can see colors, and those who have trouble seeing them. There are few research examples focusing on both the color scheme and the memory capacity on Web pages. We confirmed the value. We made a page of the same hue color arrangement. The hue was red and blue, and the tone of the page was selected based on the previous research of Zhang et al[1,2]. It was hard to see the page including colors with high levels of saturation, while the page with a saturation difference between the 2 colors of about 4.5 was easily remembered. We thought that the visibility intervention and the color of high saturation influenced the memory amount in the reader. In the future, it will be necessary to investigate the readability of characters when perceiving high saturation colors on the display.

Conflict of Interest: Nil

Source of Funding: Self source

Ethical Clearance: Ethical approval taken from the concerned ethical committee

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The Effect of Work Loads on Work Satisfaction with Work Structure as a Variable of Mediation

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Abstract

Job satisfaction is one of several factors that is very important to get results maximum. Satisfaction can be influenced by several factors, organizations need to pay attention these factors to increase employee job satisfaction. The purpose of the research to find out the influence of workload on job satisfaction with work stress as a variable mediation. This research was conducted at the University. Number of samples 55 employees were taken, using the saturated sample method. Data collection method with survey with a questionnaire as a tool and interviews. Path analysis is used to get results so that the workload is found to have a positive effect on work stress, if the workload Employees increase employee work stress will increase. Workload has a negative effect on job satisfaction, when workload increases, job satisfaction decreases, and vice versa.

Job stress has a negative effect on job satisfaction. Job stress increases, job satisfaction decreased, and vice versa

Keywords: *Work load, job satisfaction, work stress.*

Introduction

The factors involved in job satisfaction are essential to improve worker happiness. One of those psychological problems most often encountered in recent years are stress and related illness with stress, because the ever-changing world, everyone is affected by stress regardless of age, gender, profession, social or economic status[26]. The consequence of globalization for employees is change with certain demands, if the employee can not adapt then the old it will be regarded as a source of stress.

Subject of this research is lecturer of University, this company move in some fields, initially this company stands just move on field of ship and oil agency. The company has been able to expand to several divisions to date, The company has a very growth rate both of which are believed to be the number of newly formed subsidiaries and the widespread branch of subsidiaries. Number of employees on duty at the headquarters is 55 people. Organizational job satisfaction is indicated by several attitudes among others attitudes of members of the organization, absenteeism or absenteeism, delays[4]. Lecturer University mentioned, many employees who arrived late or go home ahead without the knowledge of superiors. Attendance of University in Jakarta. There are some lecturers who do not come to work for no reason. The personnel department says there are often employees who permit a few hours or several days to attend religious ceremonies. Problems that occur, the widening of the division and the increase of the subsidiary makes the focus the director is divided into several divisions. This will decrease the spirit, work motivation, increased work stress so that job satisfaction decreased. Employees who used to be at the maturity division felt little attention director.

The heaviest burden is felt today permit, this will make employees feel the work is too heavy coupled with deadlines deposited monthly reports to superiors. Job satisfaction is the opinion of the employee fun or not about his job, the feeling is visible from the behavior both employees to the job and all the things that dialamidi work environment[11]. According to the conclusion[8] mentions the workload is a number of activities that require expertise and must be done in the run time in a

physical or psychic form. States workload is a job task yag be a source of stress like work requires working quickly, producing something and concentrating from stress work. According the period of time in doing job activity in accordance with the capabilities and employee capacity by not showing signs of fatigue.

Stress that occurs in the workplace causes organizations bear the burden: low quality of service, staff turnover high, corporate reputation becomes bad, corporate image becomes bad, workers' discontent. The impact of job stress can be grouped into three category are physiological symptoms, psychological symptoms, behavioral symptoms. Sources of work stress include, sources stress outside the organization, the source of stress from the organization, the source of group stress, the source individual stress[17]. Mentioned several causes of stress in the workplace are life changes, hassles, work stress, career and development workload directly related to how the workload of employees .

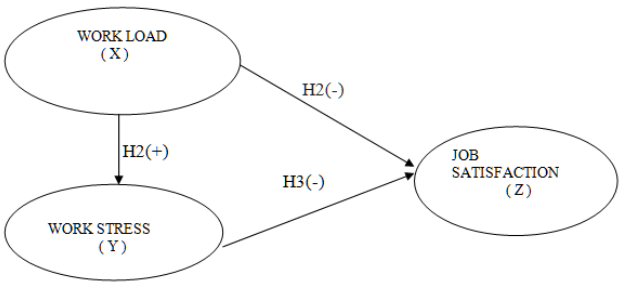

Figure 1: Conceptual Model of Research

H1: work load positively affects work stress: Found that the workload is high have a negative effect on job satisfaction[2]. Give results, there is a significant negative relationship between work load and satisfaction work[23]. In the study, states that job satisfaction affected by the day-to-day workload, employees are more satisfied when they are given a lower workload. Lower job satisfaction found in higher workloads[20]. Find nursing staff which have an objective workload tend to have a degree of satisfaction work greater than the high objective workload.

H2: Workload negatively affects Job Satisfaction: Find job satisfaction is negatively affected by work stress. Working stress has negative effect on job satisfaction. Stress work including factors that affect job satisfaction. Stress and job satisfaction is negatively related. Research conducted states there is a strong relationship of job stress to job satisfaction[6]. Suggest that increased stress is linked with decreasing job satisfaction[21]. States exist a significant relationship stress with job satisfaction[22]. Found that there are many stress factors which is related to work which leads to decreased satisfaction between pharmacist. Job stress negatively affect Job Satisfaction. By statistics can be shown that job stressor has a significant negative effect against job satisfaction .

H3: Job Stress negatively affects Job Satisfaction: The research hypothesis is summarized in Figure 1.

Method

This research is associative, research method using method quantitative research instrument using Likert Scale, collection technique data using interviews, questionnaires and observations. Satured samples are used ie as many as 55 people. Data analysis using Path Analysis. University is chosen because job satisfaction is considered very important in progress company to date. object of research that is work load, job satisfaction and work stress. Workload (X) as an exogenous variable, work stress (Y) as variable of job satisfaction mediation (Z) as endogenous variable.

Test Validity using Pearson correlation test with the provision if the value greater than 0.3 means valid, reliability test using Cronbach Alpha provided that a value greater than 0.6 means reliable.

Data analysis techniques use path analysis to analyze an unherual causal relationship between variables that are arranged accordingly temporary order. The steps taken create a diagramthe pathway of the research model, building structural equations, calculating the theory trimming, partial effect test, test sobel, summarize and conclude.

Results and Discussion

Characteristics of respondents based on 4 aspects, namely age, gender, duration work (year) and education level. The questionnaire distributed was 55 and back as many as 55 questionnaires. Respondents with age above 35 years, type male sex, long working 0 to 5 years san level and diploma education bachelor who dominated as much as 54.55 percent, 83.63 percent, 47.27 percent, 54.54 percent.

Assessment of respondents to the workload is good, seen from the average score of total score of 3.34. Assessment of respondents to work stress is good, seen from the average score of total score of 3.36. Assessment of respondent to job satisfaction variable is good seen

from the average score of the total score is 3.77.

Affects workload on job satisfaction, seen H0 denied and H1 is accepted. Because there is an influence between the two variables, the magnitude known effects of standardizied coefficient betasebesar - 0,237 or - 23,7 percent which means workload has a negative effect on job satisfaction of 23.7 percent. The effect of this magnitude is significant because of the significant value of 0.00.

The effect of job stress on job satisfaction is seen this denied H0 and H1 be accepted. Because there is an influence between the two variables, the magnitude of influence known from standardizied coefficient beta - 0.846 or - 84.6 percent of which mean work stress negatively influence to job satisfaction equal to 84,6 percent. The effect of this magnitude is significant because of the significant value of 0.00.

Conclusion

Workload has a negative effect on job satisfaction with job stress as a mediation variable. Work load positively affects the work stress on Univversity in Jakarta. Workload negatively affects satisfaction work at University in Jakarta. Job stress has negative effect on job satisfaction at University in Jakarta. The company should give notice before giving assignment for employee workload not heavy. Companies should not set too high a target and task demands to reduce employee stress. The boss needs to give positive feedback to improve employee job satisfaction. Company is expected to maintain and improve the provision of sufficient time to complete an assignment to smooth the workload, pay attention to rising positions in work and pay attention to the position accordingly with the employee's ability to reduce job stress and the salary provided must be fair in accordance with the work that employees do.

Ethical Clearance: Taken from research group committee

Source of Funding: Self

Conflict of Interest: Nil

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Lecturers' Knowledge About Environmental Issues, Personal Responsibility and Personality: Its Effect on Lecturers' Intention to Act in Saving our Environment

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Abstract

This research was aimed to find out the causal study on the factors that affect intention to act: knowledge of environmental issues, personal responsibility and personality. The research method used survey with a causal approach and characterized by a data analysis technique using path analysis. The data were collected using the instruments. This research used 120 lecturers as sample. There are four instruments for measuring knowledge about environmental issues (20 items, rel .847), personal responsibility (20 items, rel .823), personality (20 items, rel .742), and intention to act (20 items, rel .713). The research finding showed there was a direct and significant effect between knowledge about environmental issues and intention to act, there was a direct and significant effect between personal responsibility and personality, there was a direct and significant effect between personality and intention to act, and there was an indirect and significant effect between personal responsibility and intention to act through personality.Based on those findings, it could be concluded that knowledge about environmental issues, personal responsibility, and personality had direct and indirect effect on intention to act of lecturers at University of Bina SaranaInformatika Jakarta.

Keywords: *Knowledge about Environmental Issues, Personal Responsibility, Personality, and Intention to Act.*

Introduction

Environmental problems are the most vital problems all mankind face today. The reasons of environmental problems are generally described as industrialization, over population, developments in science and technology, increasing needs and globalization (Davis,1998)[1] while mankind is considered as the most effective factor in environmental problems in terms of their thinking and way of behavior (Watson & Halse, 2005)[2].

The aim of environmental education is to develop a world population with knowledge, skills and attitude as well as individual and social tasks and responsibilities to provide contribution to solutions of present environmental problems and to prevent possible future ones (Kim,2003)[3]. Most of research revealed the relation between environmental knowledge and environmental behavior (Dillon & Gayford, 1997)[4], however, it is highlighted that environmental knowledge is not an enough component for positive environmental behavior (Hungerford & Volk,1990)[5]. Knowledge about environmental issues, personal responsibility, and personality related to a strong intention to act from the lecturer will be seen through various experiences. People who have knowledge aboutenvironmental issues, personal responsibility and personality and a strong intention to take action to conserve biodiversity. Based on these descriptions, researchers are interested in conducting research on the influence of knowledge about environmental issues, personal responsibility and personality on the intention to act of the lecturer at University of Bina Sarana Informatika.

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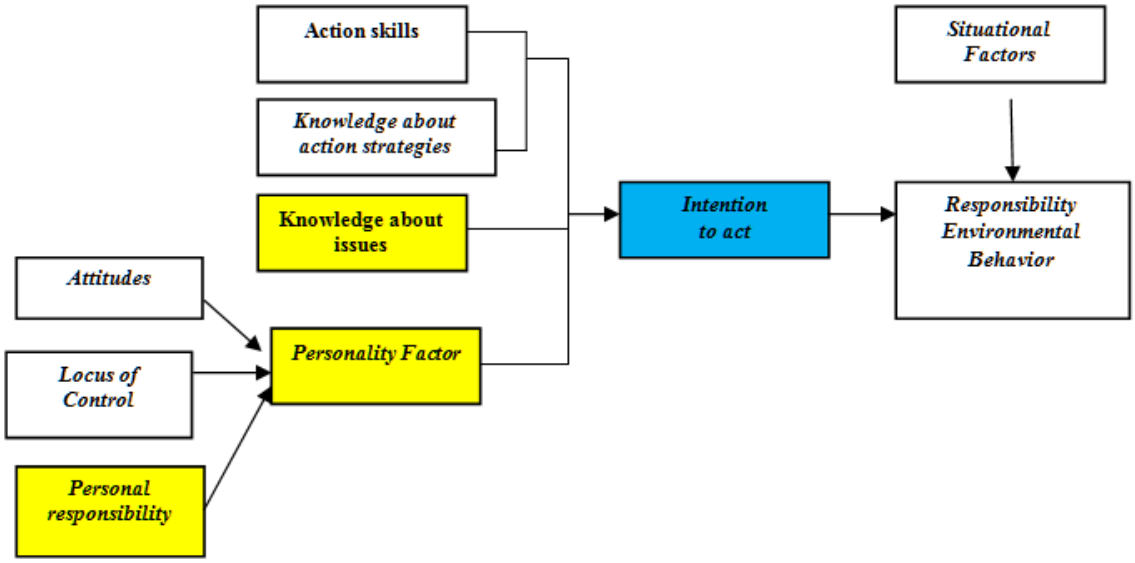

Figure 1

Hines Model related to Factors Affecting Environmental Personality: Based on the picture above, a person also has knowledge about strategic actions (knowledge about action strategies) to give a contribution in solving problems that occur, as well as having skills in performing an effective and efficient action in dealing with certain conditions (action skills). Besides one's tendency to act (intention to act) is also predicted by variables or personality factors, such as attitude, internality and externality of locus of control, and also personal responsibility.

In Theory of Planned Behavior (TPB), intention is a cognitive representation of one's readiness to perform certain actions, and this intention can be used to measure one's actions (Ajzen,2002)[6]. That is, a person's actions will be realized if there is his intention to behave act. The concept of intention outlined above, it can be said that one's work life will be very dependent on intention. This means that every effort or work will be realized if there is an intention in working. And if the intention in working is good, it will have a good impact on work life or vice versa, because the good and bad of a person's work life is a concrete implementation or manifestation of his intentions.

Knowledge about environmental issues stated everything that someone knows in mastering material about environmental issues such as overpopulation, resource depletion, and pollution, which were learned through the dimensions of Knowledge about specifics, Knowledge about ways and means of dealing with specifics (Knowledge about ways and means related to specific), Knowledge about universal and abstract in a field (Jennifer & Garreth,2005)[7].

People who have responsibilities display a number of abilities in carrying out certain actions (Marie,2009)[8]. These capabilities include the ability to set realistic goals, perseverance, and flexibility. Personal responsibility as the responsibility that exists for each individual who makes him responsible for actions, emotions and behavior (Hergenhahn & Matthew,2005)[9]. Personal responsibility towards the environment can be synthesized into a conceptual feeling that is someone's feelings in taking responsibility for actions, without expecting and denouncing what has been done in relation to various environmental issues with the aim of protecting the environment sustainably.

There are five dimensions that underlie human personality, namely conscientiousness, agreeableness, neuroticism, openness, and extraversion (Colquitt & Wesson, 2009)[10]. The five dimensions of personality can be measured through indicators: Conscientiousness (reliable, organizational, trustworthy, ambitious, hardworking and persevering), Agreeableness (kind, like working together, sympathetic, helpful, polite and warm), Neuroticism (moody nervous, emotional, alert, restless, easily offended), Openness

(inquisitive, delusional, creative, inferior, polite, smart) andExtraversion(talkative, sociable, passionate, resolute, brave, powerful).

The strength of the lecturer's motivation depends on his/her personality (Harun,2019)[11]. Lecturers with friendly personalities will have the desire to be able to communicate well with students, as well as creative lecturer will always have a desire to innovate with a variety of learning techniques appropriate to the situation and conditions of the students, so that learning objectives can be achieved. Personality is what encourages lecturers to determine the attitude and achieve the desired goals.

The lecturer's personality will shape the patterns of lecturer behavior which means the response shown by every individual to situations closely related to personality of the individual (Raza & Shah, 2017)[12].

Material and Method

This research is quantitative research that uses survey method with a causal analysis approach and the data analysis technique used is path analysis to examine the direct effect and indirect effect between exogenous and endogenous variables. This study involved 120 English lecturers at Faculty of Communication and Language, University of Bina Sarana Informatika Jakarta as respondents with a composition of 20 English lecturers as respondents for instrument testing and 115 English lecturers selected in research samples using Simple Random Sampling (SRS). There were four instruments used to measure knowledge about environmental issues, personal responsibility, personality and intention to act which validity have been measured using Pearson Product Moment and reliability using Cronbach Alpha.

Result

The results for each variable were intention to act (20 items rel .713), knowledge about environmental issues (20 items rel .847), personal responsibility (20 items, rel .823), and personality (20 items, rel .742). The results of the calculation of the path coefficient in this study can be seen in the table below:

Table 1. Calculation of the Path Coefficient

Path	ρ	Causal Effect			Total	t-count	t-table α = .05
		Direct	Variable being passed X3	Indirect			
X1 on X4	ρ41	.161	-	-	.161	2.102*	1.97
X2 on X3	ρ32	.378	-	-	.378	5.111*	1.97
X3 on X4	ρ43	.335	-	-	.335	4.056*	1.97
X2 on X4	ρ42	.217	.126	.126	.343	4.842*	1.97

* $p < .05$

Data which presented including direct and indirect effect from knowledge about environmental issues

(X1), personal responsibility (X2), personality (X3), and intention to act (X4).

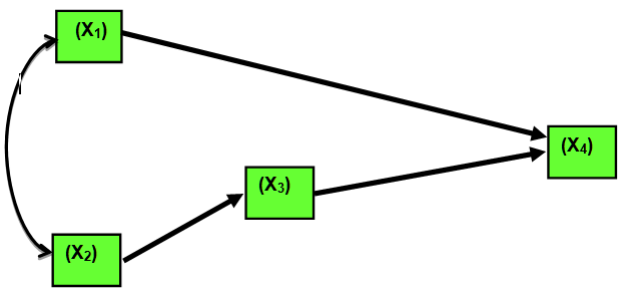

Figure 2: Causal Effect between X1, X2, X3, and X4

The results of hypothesis testing show that: (1) there is a direct and significant effect of knowledge about environmental issues on intention to act; (2) there is a direct and significant effect of personal responsibility on personality towards the environment; (3) there is a direct and significant effect of personality towards the environment on intention to act; (4) there is an indirect and significant effect of personal responsibility on intention to act through personality towards the environment. This means that intention to act of lecturers is affected by variations in knowledge about environmental issues, personal responsibility and personality towards the environment.

The results of this study were supported by other

studies which expressed that awareness of responsibility and agreeableness are positively correlated with health awareness and environmental awareness (Ramazan & Seygi, 2014)[13].

Discussion

Individuals who care about environmental issues such as limited natural resources and the well-being of all species have social responsibility attitudes towards consumption culture, while population differences in basic personality traits related to national differences in environmental sustainability (Hirsh, 2014)[14]. Xu (2017)[15] revealed that Personality traits and cognitive abilities can be used as markers for financial groups at risk because they are high in neuroticism and low in ability to experience greater financial difficulties. Internal locus of control can bring a person's level of positive attitude, but attitudes do not affect intention to act (Hwang,et.al.,2000)[16].

Personality factor determined someone to act and take a role in protecting and preserving the environment (Adams,2003)[17]. The desire to act someone became a determinant in behaving environmentally responsible (Ajzen & Manstead, 2007)[18]. Personality factors that play an important role in the decision include experience in childhood, level of knowledge and education, gender, age, and daily activities are undertaken (Gifford & Nillson, 2014)[19]. Changing the behavior of consumerism is more environmentally friendly, sensitive to issues of changing ecosystem functions, and other behaviors which is specifically related to their daily activities (Hines, et.al. 1987)[20].

In the research done by Pratiwi (2019)[21], it was told that efforts to induce environmental responsibility have been carried out including by implementing the good sustainability campaign (Font & McCabe,2017)[22], environmental and social responsibility education (Aguado & Holl, 2018)[23], and Adiwiyata school program (Desfandi, 2015)[24]. Community involvement is a strategic effort to create a mutually supportive and sustainable environment (Kvasova, 2015)[25]. On the other hand, this effort is indicated to be able to improve socio-cognitive which has an essential role in determining the desired environmental responsibility (Sawitri & Hadi, 2015)[26]. Social aspects are very fundamental because in some studies it was reported that the appearance of attitudes is not directly influenced by behavior but rather on intentions that end at the norms that apply to the community (Kollmus & Agyeman, 2002)[27].

Therefore, the results of this study can be used as reinforcement of the concepts that have been believed to integrate learning and teaching process that can grow and harmonize the personality and intention to act responsibly.

Lecturers who have a high personal responsibility can learn how to respect the rights and feelings of others, decide their own desires and the importance of being responsible (Ahsanul, et.al.,2019)[28]. It is relevant to lecturers who have higher personal responsibility can develop sensitivity to others (including compassion, empathy and interpersonal skills) and the ability to apply teaching throughout programs into wider life (eg. universities, homes) (Ernst & Beery, 2015)[29].

Lecturers who have higher personal responsibility are able to become independent educators, able to play an active role in teaching and their desires more responsibly. Lecturers with higher personal responsibility are able to become confident individuals, more responsible and creative desires including the ability to make rational and informed decisions about their lives and accept responsibility for their actions (Mergler & Patto, 2007)[30].

Personal responsibility for the environment had an influence on one's desires which had an effect on the behavior of the environment itself (Pan,et.al.,2018)[31].

Conclusion

Based on the findings, it can be concluded that if you want to increase the intention to act, the predictor variables of knowledge about environmental issues, personal responsibility, and personality need to be considered. So that environmental education activities can sustain the objective of forming knowing intention to act, these activities should pay attention to strategies for building the knowledge about environmental issues, personal responsibility. Knowledge aboutenvironmental issues and personal responsibility will influence personality as mediator variable and will ultimately increase lecturer's intention to act.

To develop knowledge about environmental issues, personal responsibility and personality, the environmental education activities carried out need to provide opportunities for lecturers to actively take part, learn various environmental issues through explorative activities, talk over about environmental attempts and provide lecturers to held activities with the community. Lecturers are people who give education either for

academic or morale and play as role models for future lives.

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Biological Teachers' Citizenship Behavior: A Confirmatory Study Involving the Effect of School Leadership and Integrity

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Abstract

Teachers' integrity pays important role in school organization which include honesty. To be honest is difficult for some people including biological teachers in teaching the truth of biological concept. How integrity could be used as mediated factor between school leadership and teachers' citizenship behavior (CB) was a research problem. A causal survey, therefore, used on this research by taking 100 senior high school biological teachers. Data collected by administrating three instruments which measured teachers' CB, school leadership and integrity and data analyzed by applying path analysis. Research findings showed that teachers' CB directly and significantly affected by school leadership, in this case, integrity was not positively found to be good as mediated variable between school leadership and teachers' CB. Therefore, when teachers performance would like to be well managed then factors such as school leadership could be improved as part of doing continuous improvement for increasing school quality by considering biological teachers' performance.

Keywords: *School Leadership, Integrity, Honesty, Citizenship Behavior, Path Analysis.*

Introduction

In the current era of globalization, the need for human resources who are able to think critically, creatively, innovatively and compete nationally and internationally continues to increase. The progress of science and technology which is rapidly increasing resulting in competition for human resources is also increasingly high.[1] Therefore, the development of the quality of human resources must continue to be done through various aspects.

One of them is the quality of human resources can be developed through education. Education is defined as a complex and planned process with the aim of developing individual potential to possess good personality, intelligence, and special skills.[2] The educational objectives will not run optimally without the support of educational organizations that contain professional workforce. Educational organizations that are in line with educational goals are schools. School is defined as an educational organization that creates outstanding human and academic resources.Described the current state of schools, competitive and dynamic schools that require excellence in academics.[3] Thus, achieving superior and effective in the academic and non-academic fields requires competent school components, especially teachers.

Most teachers cannot carry out their duties and obligations to the maximum.[4] The decline in the quality of teachers in these schools can cause low quality schools and not run effectively. Teachers are said to be the main key in the whole education process because the performance produced by the teacher will determine the quality of an educational organization. Therefore, educational organizations such as schools can run effectively, efficiently and productively if the teacher can give more performance to the school.

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The teacher does not only carry out the main task but also does the task outside of his formal obligations. Employees who work outside the job description will be able to increase the effectiveness of the organization.[5] A person's behavior in doing work outside of formal obligations can be called citizenship behavior. CB is the wise behavior of individuals who always want to do more work than their demands.[6] CB optimization can be supported by 2 factors, namely school leadership and integrity.

In this regard, school leadership has a great involvement in CB. The principal as the highest leader in the school in optimizing the citizenship behavior of the teacher can be through ideal influence (charisma), inspiration, and intellectual stimulation. Providing motivation from leaders can also lead to the willingness of subordinates to contribute to the goals of the organization, without expecting immediate personal and tangible rewards. In addition to school leadership there is integrity to optimize CB. Integrity is someone who is honest and the words spoken according to actions.[7] With the integrity of the teacher, the goals set are more directed so that they are able to optimize the teacher's CB in schools.

Thus, the research problems of this research are whether the theoretical model about school leadership along with CB through integrity confirmed by an empirical finding model.

Before solve this research problems, it necessaries to explain in advance what is meant by Citizenship behavior (CB) which part of performance, leadership and integrity as well as part of trust.[8] CB is that individuals who do more voluntary work in an organization will feel satisfaction at the performance they produce.[9]

CB that played by the teachers are very.[10] Teachers who have citizenship behavior could give positive values toward tcolleages and stakeholders in school. The existence of teachers' citizenship behavior in school could give significance transformations. Among of the transformation experienced by the school is it could be reached its purposes and school management becomes more innovative, productive and responsive.

CB owned by individual are as follows,[11]:

a. Altruism. These dimention refers to give rescue which is not their obligation.

b. Conscientiousness means loyal individual behavior toward organization's rules and act more than minimum duties.

c. Sportsmanship, it means being tolerance toward unsatisfy situation in a company without raise objections.

d. Courtesy, can be said that it has meaning to keep good relation with colleagues in order to get off from interpersonal problems.

e. Civic virtue, it can be considered as behavior that indicated responsibility in company life.

In an organization such as school which is conduct leadership act as principals.[12]Leadership is applied by the principals has some impact for school's progress. Therefore, the principals' behavior must be positive in order to give good influence for tecahers and the others.

Two leadership style, such as transformational and transactional leadership.[13]Transformational leadership is based on increasing the level of awareness follower about output value and success of subordinates. In contrast with transactional leadership based on expected reward for the obedience followers appropriate to the effort and loyality toward the school.

Each individual has different behavior, positive and negative behavior. However, there must a people behavior has by an individual in an organization. One of that was integrity, integrity was behavior embed mutual trust and confident, created cultures which are supporting high ethic standard, fair and had some ethics to others; then showed responsibilities and commitment in conduct an act.[14]

Integrity has five dimensions that refer to the concept of trust as follows: a) integrity refers to honesty, honorable and truth in conduct everything, b) competencies based on people's knowledges and skills interpersonally, c) consistency, individual's skill could be count on, d) loyality means immolate personal needs to protect others, e) openness, accepts others' advices and work together.[15]

Research Methodology: This research objective was to get the information about the direct and indirect effects of school leadership on integrity, integrity on CB, and school and CB leadership through integrity. The causal survey method used to selection of 100 biologicals' teachers. There are three research instruments that measure (CB = X3) with 36 items, (school leadership = X1) 51 items and (integrity = X2) 34 items. Data analyzed by path analysis.

Result and Discussion

Based on statistical calculation used by SPSS, it found that school leadership had been directed influence toward integrity. It is showed by phi-coefficient 0,139. Leadership had been eight dimension such as idealized influence, inspirational motivation, intellectual stimulation, individualized consideration, contingent reward, management by exception (active), management by exceptions (passive), laissez-faire, proved be able to influence integrity. However, there were a lot of research which did not know what are the dimension of leadership. Leader who give good example towards in their behavior would followed by their employee. A leader who has honesty and consistency could build employees' integrity.[16]

Meanwhile, school leadership and CB had direct and significance influences by phi-coefficient 0,184. Leadership could be influence employees' CB.[17] There were two leadership style might be influence CB, such as transformational and transactional. Both of those style, transactional style is the highest which had influence CB because giving rewards could given motivation to the employee.

In the case, integrity and CB had directed and significance influence.[18]However, in this study, integrity did not have directed and significance influence by phi-coefficient 0,062. Among three dimension of integrity, such as honesty, consistent, trustworthiness. Meanwhile, school leadership has directed and significance influence toward CB. It represented by phi-coefficient 0,184. Although, integrity did not has significance and directed influence. It described. Those dimension were not known yet which could give influence to CB. It needs continuing research.

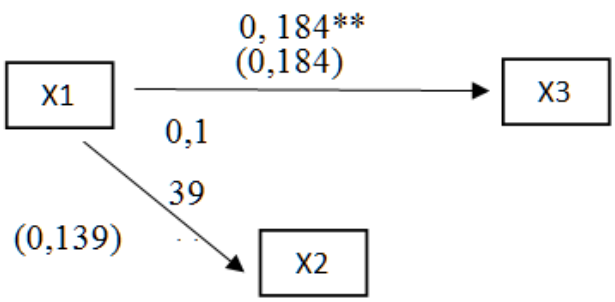

Fig. 1: Empirical Model, X1 = School Leadership; X2 = Integrity; X3 = Citizenship Behavior, **p < 0,05

Conclusion

Based on the findings, school leadership has stronger influence directly and significantly than citizenship behavior for biologicals' teacher. Meanwhile integrity did not have directed and significance influence. Those results are represented by phi-coefficient which leadership placed in the first. Then following by citizenship behavior and finally, integrity in the last.

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Ethical Clearance: Done by Research Committee.

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Biological Teachers' Personality and Task Performance Mediated by Procedural Justice

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Abstract

In any organization, especially in school system, justice is among other things discussed by teachers and school principal. Question about how teachers will well performed, theoretically influenced by how their personality and how they treated with full of justice, procedurally. The objective of this research, therefore, tried to find out whether biological teachers' task performance affected by personality and procedural justice as well. A causal survey used by involving 90 senior high school biological teachers. There were three instruments developed for measuring big-five factors-personality (P), procedural justice (PJ) and task-performance (TP). Data analyzed by using path analysis after analyzed by regression and correlation. Research findings revealed that personality and procedural justice directly and significantly affect teachers' task performance. Moreover, procedural justice was a good mediated factor connecting between personality and task performance. It could be concluded that if teachers' task performance would like to be improved positively, teachers personality and procedural justice could not be neglected due to teachers' task performance variation affected by those two factors, in order to build a high biological teachers quality.

Keywords: *Big-five Personality, Procedural Justice, Task Performance, Path Analysis.*

Introduction

Schools are formal educational institutions whose role was to achieve educational goals. The purpose of national education includes making students have knowledge, skills, and character. Quality of human resources is a benchmark of the progress of a country. Teachers are one of the determinants of the high and low quality of education. The role of the teacher was very important in the education. In achieving good quality education is strongly influenced by the performance of teachers in carrying out their duties so that teacher performance becomes an important demand for achieving educational success.

Teacher competence was the main requirement for achieving quality education because teachers interact directly with students through learning in class. In learning, teacher interaction with students will largely be determined by the personality characteristics of the teacher concerned. Teachers who master personality competencies will greatly help efforts to develop student character and create an interesting and innovative learning processes.

At school, teachers have large moral duties and responsibilities towards student success. Teacher performance is a collection of various tasks to achieve educational goals. In an organization, one of the factors supporting the increase in performance was procedural justice. Procedural justice is a person's assessment of decision making in accordance with the procedures performed by the leadership of members of the organization.

Hoy & Miskel[1] explained the reasons why one high school was so productive and the teacher was eager to work.[1] Hoy explained that, principals were open and friendly and treated teachers fairly and treated them as colleagues, while at the same time asking them to implement high performance standards. Therefore, the

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procedural justice factor that supports the teacher to work as well as possible was very important.

Personality can affect the assessment of the organization, personality was needed such as conscientiousness, agreeableness, and emotional stability in assessing procedural fairness received by the teacher. Therefore in this research, research problems were whether biological teachers' task performance was affected by personality and procedural justice as well.

Before solving those problems, it should be made clear what actually meant by task performance was part of job performance, personality and procedural justice. Colquitt, LePine and Wesson[2] described job performance was formally defined as the value of the set of employee behaviors that contribute, either positively or negatively, to organizational goal accomplishment.[2] Behaviors that make a positive contribution consist of two behaviors, namely task performance and citizenship behavior. Whereas behavior that contributes negatively to the achievement of organizational goals is counterproductive behavior. Performance is behavior related to the expected completion of work, specific or formal by each member of the organization.

McShane explained that task performance refers to behaviors directed at goals under individual control that support organizational goals.[4] This means that the performance of the task aims to achieve organizational goals through the tasks given by a leader that leads to the achievement of organizational goals.

Task performance is divided into three, namely routine task performance, adaptive task performance, and creative task performance. Routine task performance involves employee responses to demands that occur normally, routinely, or in other predictable ways. Whereas adaptive task performance involves employee responses to task demands that were unusual, or, at the very least, unpredictable.

All types of performance relate to core tasks and job responsibilities and often relate directly to functions listed in formal job descriptions. These statements reveal that the performance of the task can be measured by the quality and amount of production or the results of the work done by someone, besides that the assessment of the performance of the task can be done through monitoring the extent to which the level of effectiveness and efficiency of someone in doing the task, then the performance is inseparable from core tasks, responsibilities, related to job descriptions.

An individual's personality can be seen from everyday behavior that radiates from within someone. Each individual can interact with other people because they have the uniqueness of each individual. The uniqueness is seen from emotions, thoughts and behavior patterns. Bruce Dyck and Mitchell J. Neubert defined personality as a unique and relatively stable pattern of behavior, thoughts and emotions exhibited by individuals.[5] George & Jones described personality is a person's permanent pattern in thinking, feeling and behaving.[6]

From the opinions of some experts, it can be concluded that personality is a relatively fixed behavior that reflects individual behavior in seeing, thinking, feeling and acting on the problems they face. Personality contains several elements, indicators, dimensions, or characteristics. The best known personality dimension model is Big Five Personality which consists of five basic dimensions, namely extraversion, agreeableness, conscientiousness, neuroticism and openness experience.

Robert Kreitner and Angelo Kinicki defined procedural justice as procedural justice is defined as the perceived fairness of the process and procedures used to make allocation decisions.[7] Procedural justice is a view of justice from every process used to produce an award.[8] Fair treatment has been proven to reduce stress levels and can improve performance and job satisfaction, commitment to the institution.

There were several dimensions in procedural justice according to Colquitt, namely the treatment of impartial leadership, justification in solving problems, consistent in the application of rules, neutral and unbiased information.

Research Methodology: This research is quantitative approach, a causal type with survey method. The objective of this research was to get information about whether biological teachers' task performance affected by personality and procedural justice. The populations in this research involved 96 biological teachers in State Senior High School Teachers (SMA) in East Jakarta. Based on the Simple Random Sampling (SRS) technique and McClave formulae, 90 biological teachers selected as sample in this research.

The instruments in this research measured by opinionnaire containing several statements. Validity of instruments has been measured using Pearson Product Moment and reliability using Cronbach Alpha. Data were analyzed by path analysis. The list of statements distributed must be fulfilled by the respondent to get information about the effect of personality (X1) and procedural justice (X2) as exogenous variable on task performance (X3) as endogenous variable.

Results and Discussion

Considering statistical computation results by applying SPSS, found that personality was directly and significantly affect procedural justice with phi-coefficient was 0.625. Procedural justice also directly and significantly affect biological teachers task performance with phi-coefficient 0,499. Then, personality was directly and significantly affect biological teachers task performance with phi-coefficient 0,706.

Personality which consists of five main dimensions, agreeableness, extraversions, conscientiousness, openness, and emotional stability proved to have high contribution in affecting procedural justice. Personality reflects the attitude of awareness that is owned by each person in accepting decisions fairly, and is able to carry out work with full responsibility, through, tenacious and persistent.

This result also supported by Nasution, Putrawan & Vivanti S which found when procedural justice would be improved, factors such as school leadership and personality could be taken into account.[9] When teachers are treated unfairly, personality and performance often decrease, even disserve to the organization. In term of teachers' personality which measured by big-five personality, found affected directly on employees' performance.[10] Robbins and Judge described the relationship of 5 personality traits and task performance, that of the 5 personality traits, there were 3 traits that have an effected on task performance, namely extraversion, adaptability, and seriousness.[11] The personality traits of the three were the ability to interact with other individuals, much preferred because they were easy to adapt, and have a large and diligent effort so as to produce high task performance.

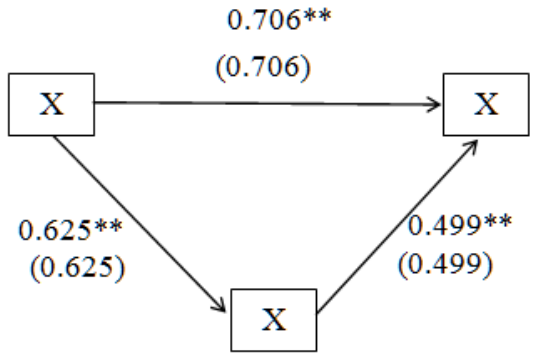

Fig. 1 Empirical Model X1 = Personality; X2 = Procedural Justice; X3 = Task Performance

Conclusions

Based on the analysis of data and findings that have been described previously, it can be concluded that: 1) Personality has a direct significant effect on procedural justice; 2) Procedural justice has a direct significant effect on task performance; 3) Personality has a significant direct effect on task performance; 4) Personality has a significant indirect effect on task performance through procedural justice. Therefore, to improve teachers task performance, personality and principals procedural justice need to be considered. In this study, procedural justice is proven to be a good mediator variable for personality and task performance.

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How is Students' Personality towards the Environment Predicted by Students' Attitude and Locus of Control?

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Abstract

The objective of this research is to find out whether there is a correlation between Students' Attitude and Locus of Control with Personality towards the Environment. For these purposes a survey method has been applied by involving 120 primary school students, in Jakarta which was selected randomly. There were three instruments developed on this research namely instrument for measuring Personality towards the Environment, Students' Attitude and Locus of Control. Hypotheses have been tested by applying F-test through ANOVA for simple and multiple regression, and correlation as well. Research results show that there is a positive a significant correlation found between Students' Attitude and Locus of Control with Personality towards the Environment. Moreover, there is a positive and still significant found between those variables after each of those independent variables were controlled by calculating partial correlation. It is also found a positive and significant multiple correlation between those variables. It should be concluded that if students' personality towards the environment would be improved therefore, students' attitude and locus of control could be taken into account.

Keywords: *Personality towards the Environment, Students' Attitude, Locus of Control.*

Introduction

The decreasing quality of the environment in Indonesia is largely due to human attitudes towards the environment. The decline in the quality of the environment will threaten the survival of future generations. Based on this, it can be indicated that human error in behaving as well as mistaken human assessment of a phenomenon (locus of control), especially to the environment will cause problems in the form of environmental crisis. Frontier mentality in this modern era is a personality trigger that is not environmentally sound in which its characteristics: 1) view that the source of natural wealth is unlimited; 2) humans are not part of nature; and 3) holds that nature exists to be mastered and used in meeting the needs of human life (Chiras, 1991).[1]

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Rhodewalt (2008)[2] explains that personality is a complex organization of cognition influencing behavior to provide direction and patterns of one's life, personality consists of structures and processes, both natural (genes) and experience. While Luthan (2008)[3] defines, "personality will mean how people affect others and how they understand and view themselves, as well as their patterns of inner and other measureable trait and person situation interaction". Brands tatter (2011)[4] describes personality traits including abilities (for example, general intelligence as well as numerical, verbal, spatial, or emotional intelligence), motives (for example, the need for achievement, power, or affiliation), attitudes (including values), and temperament characteristics as a holistic style of one's experience and actions (Openness to experience, Consciousness, Extraversion, Agreeableness, and Neuroticism). To explain a person's personality to the environment, Hines (1986)[5] developed a model of environmentally responsible behavior, wherein the model can be observed various predictors that affect one's personality such as attitude and locus of control. For more details, such variables can be seen through the figure below:

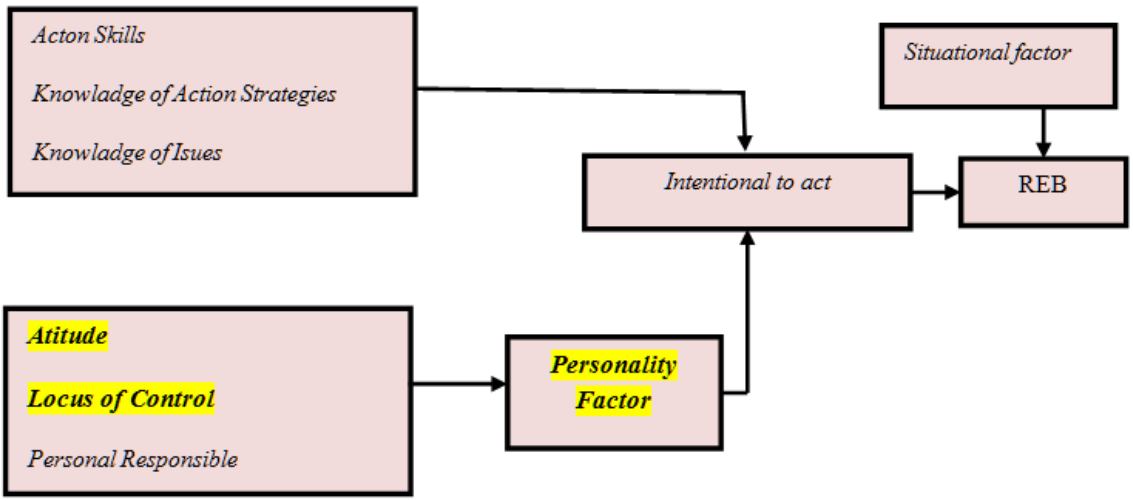

Figure 1: Environmental responsible behavior model adapted by from the model of Hines, et al. (1986)[5]

Based on the model above, it can be seen that predictors of personality variables towards the environment include attitudes and LOC. A positive attitude that is formed will then change a person's behavior. According to Schwartz (1992)[6], attitude is generally a belief that is translated into action on the desired object. Based on Azjen's (1988)[7] research on The Theory of Planned Behavior and about the Motivation and Opportunity as Determinants model, it has been widely studied that the relationship between explicit and implicit attitudes can influence a person in processing information so that behavior changes occur. Based on TPB, there are several variables used to explain pro-environment behavior, namely attitudes toward behavior, subjective norms, perceived behavioral control, and intentions (Macovei, 2015)[8]. According to Azjen (1989) in Schröder & Wolf (2015)[9] attitudes consist from cognitive, affective, and conative aspects.

Putrawan (2014)[10] explains that attitude based on the Bannet model is one's disposition before acting based on the dimensions of knowledge, feeling, and action tendency.

Locus of control is one of the personality variables that is defined as an individual's belief in being able to control his own destiny.[11]According to Morhead and Griffin (2012)[12], locus of control is the extent to which people believe their current circumstances are determined by their own actions or factors externally out of control and locus of control plays an important role in their behavior and has a real effect on what happens to them. Kreitner & Kinicki (2008)[13]states that the results achieved by the internal locus of control are ascribed to his activities. Whereas individuals with external locus of control assume that the success achieved is controlled by their surroundings. The state of the art in this study is related to the issue of contemporary personality on the environment by various predictors such as attitude and locus of control based on the Hines (1986)[5] model.

Material and Method

The method used is a survey method with correlational techniques. This research is concerned with collecting data to determine whether there is a correlation between variables and how much strength the correlation has (correlation coefficient). The inter-correlations between variables in this research are described in the hypothetical model of the study as follows:

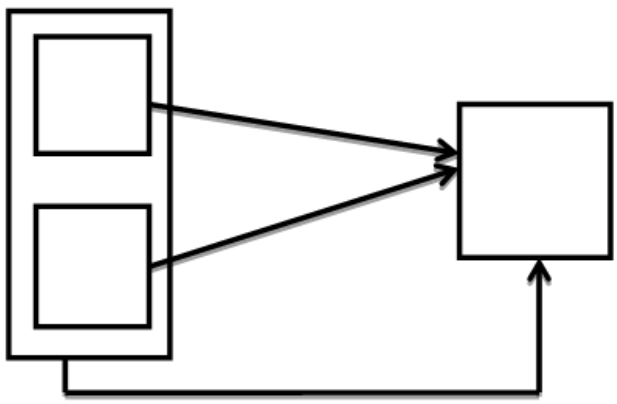

Figure 2: Hypothetical Research Model

Note: X1 = Attitudes of students towards the environment, X2 = Locus of control, Y = Environmental Personality

There are four instruments in this study, namely to measure environmental personality, attitudes, and LOC. The population of this study is all private high school students in DKI Province. The sampling technique using multistage random sampling involving 110 private high school students as research samples. Data analysis techniques using regression and correlation tests. Prior to data analysis, normality tests were performed using Liliefors. Homogeneity test uses Bartlett test. the description of the contribution of the independent variable to the variation in the dependent variable is calculated by the value of good of fit (R2) or the index of determination. The analysis program for processing data in research uses Microsoft Excel and SPSS Version 20.00 software.

Discussion

This research was carried out according to the steps of scientific procedures and a thorough analysis process was undertaken. The results obtained in this study are tested hypotheses. Analysis of the data in the previous section, the findings can be explained there is a correlation between X1, X2, and Y variables. The first hypothesis proposed in this study is that there is a positive correlation between students' attitudes and environmental personalities. The magnitude of the correlation coefficient between attitude variables with environmental personality can be figured out in the following table:

Table 1: Correlation between Attitude and Environmental Personality

Correlation	n	r_{xy1}	t_{cal}	t_{table}	
				α = 0,05	**α = 0,01**
Attitude and Environmental Personality	110	0,612	8,05**	1,98	2,62

** p< 0,01

From the results of calculations between students' attitudes with personality towards the environment indicated a correlation coefficient of rx1y = 0.612 and $t_{cal}>t_{table}$ can be concluded that H0 is rejected. The pattern of relationships between these two variables is expressed by the regression equation $\hat{Y} = 68.96 + 0.793$ X1. This finding concludes there is a positive correlation between students' attitudes with personality towards the environment. In other words, the more positive the attitude of students, the more accurate their personality on the environment. The second hypothesis proposed in this study is that there is a positive correlation between LOC and personality towards the environment. The magnitude of the correlation coefficient between LOC variables with personality to the environment can be seen in the following table:

Table 2: Correlation Between LOC and Environmental Personality

Correlation	n	r_{xy1}	t_{cal}	t_{table}	
				α = 0,05	**α = 0,01**
LOC and Environmental Personality	110	0,535	6,21**	1,98	2,62

** p< 0,01

From the results of calculations between LOC with personality to the environment indicated a correlation coefficient of rx2y = 0.535 and $t_{cal}>t_{table}$ can be concluded that H0 is rejected. The pattern of relationships between these two variables is expressed by the regression equation $\hat{Y} = 54.01 + 0.518X2$. This finding confirms that there is a positive correlation between LOC and personality on the environment. In other words, the more internal the LOC, the more accurate the personality on the environment. The third hypothesis proposed in this study is that there is a positive correlation between student attitudes and LOC together with personality towards the environment. The magnitude of the correlation coefficient between the variables X1 and X2 with Y can be seen in the following table:

Table 3: Calculation Result of Significance of Double Regression Coefficient of Positive Correlation X1 and X2 with Y

Variable	Regression Coefficient	F_{cal}	F_{table}	
			α = 0.05	**α = 0.01**
Y on $X_1$and X_2	0,714	31,56**	3,09	4,82

** p< 0,01

From the calculation of the significance of the multiple regression coefficients in the table above, an F_{cal} of 31.56 was obtained. While based on a significant level α = 0.01 obtained F_{table} at a price of 4.82. The pattern of relationships between these two variables is expressed by the regression equation $\hat{Y}$ = 27.05 + 0.431X1 + 0.428X2. Because the value of $F_{cal}>F_{table}$, it is concluded that H0 is rejected. This finding concludes that there is a positive correlation between student attitudes and LOC together with personality towards the environment, in other words the more positive the student's attitude and the more internal the LOC, the more accurate the personality towards the student's environment.

The results of correlational analysis indicate that the hypothesis testing that has been done shows that the three hypotheses proposed in this study, are accepted and are very significant. The test results can be reaffirmed as follows: (1) there is a positive correlation between students' attitudes with personality towards the environment); (2) there is a positive correlation between LOC and personality on the environment; and (3) there is a positive correlation between student attitudes and LOC together with personality towards the environment.

Discussion

Related to this attempt, Cristina (2015)[14] states Positive attitude towards work has high and positive correlations with all typological dimensions of personality, except helpless type which lowly correlates only with negative attitude towards work. Since the respondents are teachers who positively perceive work as an important condition of achievement and self- development tend to be more generous, claimed, involved, selfishness and have an internal locus of control, the effect sizes are high in the cases of the correlations between positive attitude towards work and typological personality dimensions. Concerning typological dimensions of personality, teachers with an internal locus of control are more generous and inclined to involve and to act on behalf of others, more ready to immediately react, to endorse their position in front of colleagues or principals and solve common problems, while Fabio (2019)[15] discusses about these variables using 2 kinds of levels regarding personality and attitudes; distal level and proximal level. Here is the explanation :

At a distal level (i.e., linking personality traits with attitudes toward traffic safety), anxiety and hostility predicted drivers' attitudes toward traffic safety (positively and negatively, respectively) only in older drivers. Excitement-seeking and normlessness predicted attitudes in all the three samples, even if to a different extent depending on the age.

At a more proximal level (i.e., linking drivers' attitudes with risky behaviors at the wheel), differences were slightly lessened. In fact, although attitudes didn't impact lapses significantly in older drivers and they impacted violation more relevantly in older than in adult drivers, positive attitudes toward traffic safety were globally related to less violations and errors in the three age groups.

Meanwhile, according to Darshani's research (2014)[16], it is said that the coherence between personality and locus of control can be done by balancing A and B type personality traits and locus of control situations rather sticking to extremes. According to Rotter none of the personality types or type of the Locus of control is not right or wrong. They are only psychological states. The needed factor is maintaining a balanced behavior rather expecting too much, being over estimated or being depend on fate, being too much easy going. In another side, According to Tansu (2010)[17], the research data was found that hopeless students are more internal controlled than hopeful students. Consistent with this perspective, numerous studies have found correlations between internal locus of control and hopeless.

Another opinion from Paisi (2013)[18], says The analysis of the variable gender underlined the fact that

there are no significant differences as regards creative attitudes between female students/teachers and male students/teachers. The correlational analysis of the variables of locus of control and creative attitudes has been achieved by the calculus of the correlation coefficient r = - 0, 39, which signifies the fact that the persons with an internal locus of control have an innovative style in solutioning the situations, which coincides with the results of other researches which observe that the increase of creativity through training implies a rise in internal. While Renn (1991)[19] reveals The present study's results suggest, therefore, that reported I-E differences on some employee attitudes and personality may not be as valid as suggested by past studies. Moreover, the results suggest a need for a meta-analysis of the organizationally-relevant LOC literature to determine which differences in employee attitudes and personality are due to true differences on the LOC construct and which are due to statistical artifacts. Further implications of the present study's results and recommendations for future LOC research are discussed.

Conclusion

Regarding with the problems in this study, and based on statistical calculations and the results of data analysis that have been described previously, it can be concluded the results of the study as follows; to improve personality towards the environment, we need to improve variables such as attitude and LOC. Based on the environmental personality development model by Hines (1986)[5,] attitude and locus of control are good predictor variables for predicting one's personality on the environment. For other researchers, further research can be done about personality towards the environment associated with other predictor variables based on other theoretical models.

Conflict of Interest: Nil

Source of Funding: Self source

Ethical Clearance: Done research committee

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The Effect of Personality and Motivation on Junior High School Biology Teacher's Citizenship Behavior

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Abstract

Adopting to development of technology at the era of globalization, quality of human resource has a vital role in improving the quality of education which mostly depend on teachers' quality as well. This research, therefore, aimed at finding out whether teachers' personality (big-five personality) and motivation affected on teachers' citizenship behavior/CB (performance). A causal survey used by selecting 81 teachers randomly. Three instruments developed to measure personality with reliability of .930, motivation (.918), and citizenship behavior with reliability of .884. Data was analyzed by regression, correlation and path analysis. Research results showed that teachers' motivation was good and non significant as mediated factor between personality and teachers' CB, personality directly and significantly affect teachers' CB, and motivation directly and significantly affect teachers' CB. Based on these findings, it could be concluded that variation of teachers' CB or in more specific, teachers' performance, influenced by teachers' personality and motivation variation, so when biological teachers' performance would be improved, the role of teachers' personality (big-five factors) and motivation should be taken into consideration, especially in making decision in improving continuously the quality of junior high school, particularly biological teaching and learning.

Keywords: *Big-five personality, citizenship behavior, regression & correlation and path analysis*

Introduction

Globalization is accompanied by developments in science and technology. This must be balanced with increasing human resources with quality education. One of the determinants of the quality of education is the teacher. One of the teacher's competencies is social competence. Teachers are social beings who must have empathy for others and have citizenship behavior or wise behavior. Colquitt, Lepine, and Wesson (2015)[1]defined that citizenship behavior is someone's wise behavior at work that prioritizes the interests of the organization and contributes to improving the overall quality of the settings in which work takes place that has an interpersonal dimension with the helping, courtesy, sportsmanship and organizational dimensions with the voice, civic virtue, and boosterism dimensions. Maftuhah, Putrawan, and Suryadi (2018)[2] explained thatcitizenship behavior is needed because of the lack of extra role behavior, it can be indicated from a lack of sense of responsibility in completing work, not on time at work such as arriving late and returning early and avoiding additional assignments. Robbins and Judge (2013)[3]explained that factors in personality are the ability to interact with other individuals, are easy to adapt, and have great effort and perseverance so that it can produce high citizenship behavior.

Personality influences teacher's behavior citizenship. Colquitt, Lepine, and Wesson (2015)[1] defined that personality is a tendency in someone who explains the characteristic patterns of thoughts, emotions, and behaviors that have factors of conscientiousness, agreeableness, extraversion, emotional stability, and

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openness to experience. Putrawan (2013)[4] explained that big-five personality can be implemented to measure personality. Fan, Javed and Akhtar(2014)[5] explained that personality especially conscientiousness has a positive effect on citizenship behavior. In addition, personality also affects a person's motivation for doing work. Gibson, Ivencevich, Donelly, and Konopaske(2012)[6]explained that personality is strongly associated with motivation.

Motivation influences teacher citizenship behavior. Andre (2009)[7] defined that motivation is the direction, intensity, and perseverance of a person in achieving his goals that have dimensions of direction, intensity, and persistence. A significant level of motivation contributes to extraordinary performance. Wahyuni, Putrawan, and Sari (2019)[8] explained that the lack of motivation of teachers can affect performance. Based on this description, the formulation of the problem of this research are: 1) Does personality directly effect citizenship behavior?; 2) Does motivation directly effect citizenship behavior ?; 3) Does personality directly effect motivation; and 4) Does personality have an indirect effect on citizenship behavior through motivation?. Based on this description, the purpose of this study is to determine the effect of personality and motivation on the citizenship behavior of junior high school Biology teachers in East Jakarta.

Research Methodology

The objectives of this researchwas to find out the direct effect of personality and motivation onbio-teachers' citizenship behavior.A causal survey used by selecting 81 junior high school biological teachers, in East Jakarta.Three instruments developed to measure personality with the reliability of .930 (38 items), motivation with the reliability of .918 (23 items), and citizenship behavior with the reliability of .884 (26 items).Data analyzed by path analysis after regression and correlation.

Results and Discussion

Based on the table below, it can be seen the result of significance and linearity of the regression model $\hat{X}_3 = 90.928 + .261\ X_1$; $\hat{X}_3 = 97.918 + 0.311\ X_2$; $\hat{X}_2 = 54.328 + .344\ X_1$ significant of the relationship was linear.

Table 1: ANAVA Table for Regresion Model $\hat{X}3 = 90.928 + .261\ X1$

Model	Unstandardized Coefficients		Standardized Coefficients	t_{cal}	t_{tab}	Correlations		
	B	Std. Error	Beta			Zero-order	Partial	Part
(Constant) Personality	90.928 .261	8.181 .052	.489	11.115 4.988*	1.99	.489	.489	.489

*p < .05

Based on the Table 1. personality has a direct effect and significantly on citizenship behavior with $phi_{31} = .489$, using t-test, $t_{cal} = 4.988$ more than $t_{tab} = 1.99$.

Table 2. ANAVA Table for Regresion Model $\hat{X}_3 = 97.918 + .311\ X_2$

Model	Unstandardized Coefficients		Standardized Coefficients	t_{cal}	t_{tab}	Correlations		
	B	Std. Error	Beta			Zero-order	Partial	Part
(Constant) Motivation	97.918 .311	9.151 .084	.383	10.700 3.689*	1.99	.383	.383	.383

*p <.05

Based on the Table 2. motivation has a direct effect and significantly on citizenship behavior with $phi_{32} = 0.383$, using t-test, $t_{cal} = 3.689$ more than $t_{tab} = 1.99$.

Table 3. ANAVA Table for Regresion Model $\hat{X}_2 = 54.328 + .344\ X_1$

Model	Unstandardized Coefficients		Standardized Coefficients	t_{cal}	t_{tab}	Correlations		
	B	Std. Error	Beta			Zero-order	Partial	Part
(Constant) Personality	54.328 .344	9.831 .063	.524	5.526 5.471*	1.99	.524	.524	.524

*p < .05

Based on the Table 3. personality has a direct effect and significantly on motivation with phi_{21} = .524, using t-test, t_{cal} = 5.471 more than t_{tab} = 1.99

Based on table 1,2, and 3the empirical models can be seen as follows:

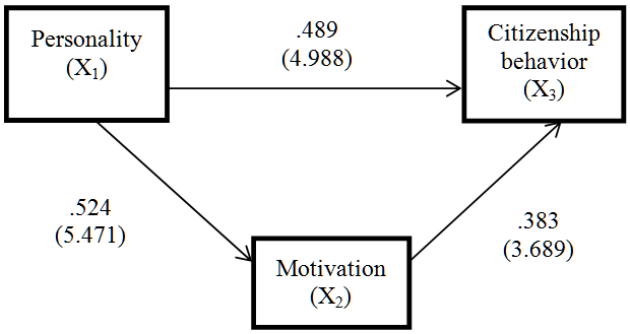

Figure 1. Empirical Model

The result of this research were (1) personality has a direct effect and significantly on citizenship behavior with phi_{31} = .489, using t-test, t_{cal} = 4.988 more than t_{tab} = 1.99; (2) motivation has a direct effect and significantly on citizenship behavior with phi_{32} = 0.383, using t-test, t_{cal} = 3.689 more than t_{tab} = 1.99; (3) personality has a direct effect and significantly on motivation with phi_{21} = .524, using t-test, t_{cal} = 5.471 more than t_{tab} = 1.99; and (4) personality has an indirect effect on citizenship behavior through motivation with$phi_{31.2}$ = .200, using t-test, t_{cal} = 1.804 more than t_{tab} = 1.66.

Based on the results of the research which states there was a direct effect between personality on citizenship behavior so it is proven that personality can effect citizenship behavior. The results of this research were in line with the results of Fan, Javed & Akhtar's (2014)[5] explained that personality especially conscientiousness contributes positively and significantly to organizational citizenship behavior (OCB). The same thing was stated by Patki & Abhyankar (2016)[9]explained that conscientiousness has a direct effect on OCB, a person who has a high conscientiousness factor also has good organizational citizenship behavior.

There were agreeableness factors that influence citizenship behavior as stated by Bourdage, Goupal, Neilson, Lukacik & Lee (2018)[10] stated that the agreeableness factor influences organizational citizenship behavior. In addition to the agreeableness factor, emotional stability also influences citizenship behavior as stated by Leephaijaroen (2016)[11]explained that the agreeableness, conscientiousness, and emotional stability factors have a significant positive effect on organizational citizenship behavior. The same thing was stated by Mushraf, Al-Saqry & Obaid (2015)[12]explained that emotional stability factors affect OCB service provider employees. Another study by Putrawan (2019)[13]explained that emotional stability is one of big five personality's factor that the most vital in predicting school principals' citizenship behavior and personality should be taken into consideration to improve school principals' performance.

There was a difference between some of the results of previous studies that are relevant to the results of this study even though all results state that personality influences citizenship behavior. Previous studies examined each of the factors for citizenship behavior while this study examined the overall model of the five major personalities. Citizenship behavior is not only influenced by personality but also influenced by motivation. This is consistent with the second testing in this research.

The results of the second testing show that there was a direct effect between motivation on citizenship behavior, so it is proven that motivation influences citizenship behavior. This is consistent with Shaaban's (2018)[14] explained that motivation is related to organizational citizenship behavior, motivated employees will increase OCB. Another study by Hemakumara (2018)[15] stated

that intrinsic motivation and extrinsic motivation have a significant positive effect on organizational citizenship behavior but extrinsic motivation has a stronger relationship with organizational citizenship behavior. In addition to extrinsic motivation, intrinsic motivation also influences organizational citizenship behavior as stated by Ibrahim & Aslinda (2014)[16]stated that intrinsic motivation gives a greater direct effect on organizational citizenship behavior than extrinsic motivation. Similarly, Ghazi & Jalali (2017)[17] stated that intrinsic motivation influences organizational citizenship behavior and increases one's work productivity. Another study by Kim (2018)[18] stated that intrinsic motivation significantly influences employee turnover, employees with greater intrinsic motivation will reduce turnover intentions.

There was a difference between some of the results of previous studies that are relevant to the results of this study even though all the results state that motivation influences citizenship behavior. Previous studies examined each of the intrinsic and extrinsic motivational factors for citizenship behavior while this study examined motivation in terms of dimensions of direction, intensity, and persistence. A person's motivation is influenced by his personality. This was in accordance with the third testing in this research.

The results of the third testing have a direct effect between personality on motivation so it is evident that personality influences motivation. This was consistent with Nuckcheddy's research (2018)[19]stated that emotional stability and extraversion factors have a significant effect on motivation. In addition, research conducted by Hazrati-Viari, Rad & Torabi (2012)[20] stated that the conscientiousness factor influences both intrinsic and extrinsic motivation. The same thing was stated by Roberts, Rogers, Thomas & Spitzmueller (2018)[21]explaind that the conscientiousness factor influences motivation. Research conducted by Kelsen & Liang (2018)[22]stated that Extraversion and Conscientiousness factors significantly influence work motivation. There were other studies conducted by Mahlamäki, Rintamäki & Rajah (2018)[23]explained that the factors of extraversion, agreeableness, conscientiousness, emotional stability have a significant relationship with motivation. Another study by Hidayati, Putrawan, and Mukhtar (2019)[24] explained that to improve teachers' personality the school must be increase teacher's motivation. Another study conducted by Harun, Putrawan, and Miarsyah (2019)[25] explained that big-five personality factor could be consider to strengthen teachers' motivation.

There was a difference between some of the results of previous studies that are relevant to the results of this study, namely the previous findings that discuss the relationship of motivation with each factor of personality while this study examines the overall five personality factors. Despite differences, the overall results of the study concluded that personality has an influence on motivation. Therefore, motivation is a good intervening variable between personality variables and citizenship behavior. This was in accordance with the fourth testing in this research.

The results of testing the fourth indicate that there was non significant indirect effect between personality on citizenship behavior through motivation. Based on these results it can be concluded that citizenship behavior was directly affected by personality and motivation, so motivation is not proven mediator variable that significantly mediates between personality and citizenship behavior.

Conclusion

Based on the results of the study it can be concluded that personality have adirect effect on citizenship behavior, motivation have adirect effect on citizenship behavior, personality have adirect effect on motivation and personality have an indirect effect on citizenship behavior through motivation. Therefore, if biological teachers' citizenship behavior or teachers' performance would be positively improved, factors such as personality (big-five personality) and motivation could not be neglected, especially in enhancing school management quality.

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Connecting Biological Teachers Self-Efficacy with Organizational Commitment Mediated by Motivation

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Abstract

When people believe that they are able to do anything assigned to them, their motivation to work harder and they feel that the work place perceived like their home in term of high in organizational commitment. So, when it would be generalized to school as an organization, then it could be a problem for this research. Considering this problem, a causal survey used by selecting 100 senior high school biological teachers as sample. Teachers self-efficacy, motivation and organizational commitment measured by instruments which have been validated. Data analyzed by apllying regression, correlation and path analysis. Research results indicated that the connection between self-efficacy and organizational commitment (OC) has been significantly supported by empirical data and significantly mediated by motivation as well. If it was discussed or talked about motivation, the factor such as self-efficacy could not be neglected rather each of these, such as self-efficacy and motivation directly affect teachers OC. That is why when school system would like to reduce the number of teachers withdraw intention, therefore, teachers OC should be strengthened by considering that teachers' self-efficacy and motivation to be well managed for improving biological teachers quality, in particular.

Keywords: *Organizational commitment, self-efficacy, withdraw intention, path analysis.*

Introduction

In the world of education, human resources must have increased quality that can compete, survive and develop in an era of globalization which is increasingly competitive. Therefore, technological innovation always increases development in an effort to win the competition. In addition, human resources are very important in an organization because the effectiveness and success of an organization is highly dependent on the quality and performance of existing human resources in the organization. In this case the teacher plays a role as human resources in the field of education that can affect the success of an organization that is the school.[1]

The teacher is the key to success in the teaching and learning process, as well as being an initiator who plays a role in the effort to form potential human resources in the development field. In this case the teacher is not solely as a teacher who transfers knowledge, but also as an educator who transfers values as well as a guide who provides instruction and guidance to students in learning according to current era.[2]

The success of an organization is inseparable from how committed a teacher is at the school where he/she teaches. Commitment refers to the willingness of employees to work positively in an organization and their continuation to continue working.[3] Without commitment, the influence will not be maximized, obstacles cannot be penetrated, and passion, impact, and opportunities can be lost.[4]If the commitment of the teacher organization is high, it will encourage motivation, the level of involvement in the organization, loyalty, work performance, and social behavior of the teacher will be high too.

Another factor that can increase organizational success is the development of work motivation.

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Teachers' work motivation will certainly increase if they feel trusted, get recognition from their work, they feel there is fairness in the workplace and get challenges to show their abilities.[5] Fokkens & Canrinus argues that motivation to become a teacher is related to involvement and commitment to their profession. If the organizational climate is conducive to the atmosphere of a familiar work environment, it will make teachers motivated because teachers are satisfied with the organization.[6]

Aside from teacher motivation factors, a teacher's self-efficacy also positively changes teaching behavior to always do the best for students.[7]According to Skaalvik & Skaalvik, the strength of motivation influence on a person's performance depends on how much self-efficacy the teacher has. The higher self-efficacy of a teacher, the more passionate he/she could be.[8]

Given the important role of teachers in increasing the success of an organization in this case is the school, which is based on the foundations stated above, so research is needed on the effect of self-efficacy and motivation on teacher organizational commitment.

Mowday, Porter & Steers describe organizational commitment as behavior related to the process by which individuals become locked into a particular organization and how they maintain their membership in this organization[9].According to Pinho, Rodrigues & Dibb, highly committed employees will view work not as a burden or obligation but as a means of working and developing themselves, because an employee is expected to be able to ensoul his/her work as well as working with the mind and heart.[10]Meyer and Allen have identified three types of organizational commitment, namely affective commitment, continuance commitment, and normative commitment.[11]

Corsun & Enz said that self-efficacy is defined as the belief of individuals to explore their potential so that they can be developed further, so they can carry out work better.[12]According to Schunk & Dibenedetto, the higher self-efficacy will cause individuals to dare to make behavioral changes such as harder efforts and higher concentration to achieve goals. Self-efficacy is one of the factors to generate positive efforts in carrying out work.[13]According to Bandura, self-efficacy is influenced by four important sources of information: mastery experience (performance accomplishment), vicarious experience, verbal persuasion, and physiological and emotional state.[14]

According to George & Jones, work motivation can be defined as a psychological drive to someone who determines the direction of one's behavior in the organization, the level of effort, and the level of persistence in facing an obstacle or problem.[15]Motivation theory is based on the theory put forward by Maslow namely Maslow's Hierarchy of Needs, where the motivation of human needs will be: (1) Physiological Needs, (2) Safety and Security Needs, (3) Love and Belonging Needs, (4) Self-Esteem and Needs Self-Esteem, (5) Need to Know and Understand, (6) Aesthetic Needs, and (7) Self-Actualization Needs.[16]

Research conducted by Lunenburg shows the results that self-efficacy affects employee motivation and perseverance in completing difficult tasks.[17]In line with the results of Cherian & Jacob's research which states that self-efficacy affects the efforts of employees in improving their performance and motivation.[18]

Based on the results of research Meysam & Jamali stated that work motivation has a significant positive effect on employee organizational commitment.[19] Tentama & Pranungsari's research also stated that there was a significant positive correlation between teacher work motivation and organizational commitment. The stronger the teacher's work motivation, the higher the organizational commitment would be. Otherwise, the lower the teacher's work motivation, the lower the organizational commitment would be.[20]

Akhter, Ghayas & Adil's research also shows the results that self-efficacy is positively correlated with organizational optimism and commitment. An employee with positive beliefs about himself becomes confident about the work assigned to him, shows good performance and has satisfaction with his work, so the level of commitment is higher for the organization.[21]This is in line with the results of research by Klassen et. al. which states that teachers with high self-efficacy have strong ideals and commitments to their profession thereby increasing their work commitment.[22]

Research Methodology: The purpose of this study was to obtain information about the direct and indirect effects of self-efficacy (X1) and motivation (X2) on the organizational commitment of Biology teachers (X3). This research was a quantitative study using a causal survey method. Respondents were collected with a total of 100 Biology teachers in the Bekasi area, researchers took a sample of 91 teachers with simple random

sampling technique. There were three instruments that measured self-efficacy, motivation and organizational commitment that each amounted to 30 items. Data were analyzed using path analysis.

Results and Discussion

Based on the results of statistical calculations using SPSS, that (1) there was a significant direct effect of self-efficacy on motivation with a phi-coefficient = 0.604; (2) there was a significant direct effect of motivation on organizational commitment with the phi-coefficient = 0.462; and (3) there was a significant direct effect of self-efficacy on organizational commitment with a phi-coefficient = 0.508.

The results of the first hypothesis testing show that there was a direct effect of self-efficacy on motivation. This result was supported by Tabernero & Hernandez's study which states that there was a positive relationship of self-efficacy with individual intrinsic motivation.[23] White also states that self-efficacy was strongly affectthe intrinsic motivation.[24]

The results of the second hypothesis testing show that there was a significant direct effect of motivation on organizational commitment. This result was supported by Hayati & Caniago's research which states that employees who were more intrinsically motivated by their work will feel more committed to their organization.[25]The results of Trivellas's research also show that motivation significantly affect the level of commitment that employees instill in the workplace.[26]

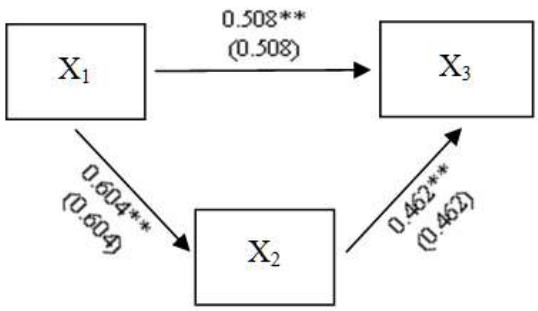

Fig. 1. Empirical Model X1=Self-Efficacy; X2=Motivation; X3=Organizational Commitment; p < 0,05

The results of the third hypothesis testing show that there was a significant direct effect of self-efficacy on organizational commitment. This result was supported by Tsai, Tsai & Wang's self-efficacy research having a significant positive effect on organizational commitment.[27]Yousaf & Sanders in his research also stated that there was a direct effect of self-efficacy on organizational commitment.[28]

Conclusion

Based on those findings and interpretation, compared to other findings, it could be concluded that the connection between self-efficacy and organizational commitment has been significantly supported by empirical data and significantly mediated by motivation as well.

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The Effect of Personality and Gender on Green Consumer Behavior

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Abstract

The difference in the consumer's personality will affect his behavior in choosing or buying a product, because consumers will buy goods that are in accordance with his personality. This study aims to look at the effect of personality and gender on green consumer behavior (GCB). This research uses quantitative, survey method and ex-post facto techniques. The population in this study were all students of the Jakarta State University, the outreach study participants were students of Catering, Clothing, Makeup and Family Welfare Education increasing 600 students. The results showed that personality had a significant influence in describing GCB and GCB differences were found in male/female student groups who had accurate personalities, better than GCB in male student groups who had inaccurate personalities. However, personality is not influenced by gender, which means that differences in GCB are influenced by interactions between personality and gender

Keywords: *Personality; Gender; Consumer; Green Consumer Behavior.*

Introduction

As written by tempo.co, Jakarta that millennial generation apparently has a high concern for the environment. This can be seen from their daily habits, one of them is their behavior when shopping. Many of those who refuse to use plastic bags and switch to using reusable bags or cardboard[1].

The above activities include environmentally friendly consumer behavior where the individual tries to make a decision in obtaining an item or service that they need without damaging the environment. Those who do not care about environmentally friendly products describe that they are people who do not understand about the environment.

Consumer behavior includes many things such as how the process of finding products and services, buying, using, evaluating, to the final activity of disposing of the products and services they expect. While the study of consumer behavior explains what products and brands are bought by consumers, why they buy the product, when they buy the product, where they buy it, how often they buy it, how often they use it, how they evaluate the product used after purchase, and whether they don't buy it repeatedly.

No two people are exactly the same in their nature or personality, each with unique characteristics that are different from each other. This is what is called human personality. The difference in the consumer's personality will affect his behavior in choosing or buying a product, because consumers will buy goods that are in accordance with his personality. In some societies gender can influence consumer behavior in terms of the roles of men and women. One dimension that makes gender-based segmentation so interesting is that male/female behaviors and tastes continue to develop. Gender also has an important role in consumer behavior. Because, the differences between men and women regarding hopes, desires, needs, lifestyle and others reflect their consumption behavior. Gender also affects consumers in decision-making behavior. Based on the background description that has been written, this study focuses on

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green consumer behavior (GCB) which is influenced by personality and gender.

Literature Review:

Green Consumer Behavior: Sciffman and Winsenblit[2] define consumer behavior as the study of consumer actions while searching, buying, using, evaluating, disposing of products and services they expect for their needs[2], whereas according to Malcnis, that consumer behavior involves an understanding of whether, why, when, where, how, how much, how often, and for how long consumers will buy, use, or discard[3].

According to Frank R. Kardes, Maria L. Cronley and Thomas W. Cline[4], consumer behavior (usually called buyer behavior) involves a study of how consumers decide to buy a product. The scope of consumer behavior activities starts from activities before buying, during buying and after consuming. The contemporary definition is far broader and tries to capture a variety of consumer activities. Consumer behavior involves all consumer activities related to the purchase, use, and disposal of goods and services, including consumer emotional, mental, and behavioral responses that precede, determine, or participate in these activities[4]. Frank R. Kardes, Maria L. Cronley and Thomas W. Cline[4] also wrote, purchasing activities are the activities of consumers in obtaining goods and services. Buying activities also include everything after completing a purchase, such as gathering, evaluating information about a product or service and choosing where to make a purchase.

After consumers make purchases or obtain products and services, it will usually be followed by a process of consumption or use of the product. Usage activities describe where, when and how consumption occurs. For example, do consumers consume products immediately after purchase, or do they delay consumption, such as when buying new clothes for future opportunities.

During consumption of products and services, consumers are expected to have a good way, especially thinking about the impact afterwards on the environment. This kind of consumption process is called a continuous consumption process. Sustainable consumption behavior as defined by Williams and Dair, is the behavior of individuals or groups that basically contribute to reducing consumption of resources, waste and pollution. Proses konsumsi berkelanjutan seperti yang dituliskan oleh Myers dan Kent adalah penggunaan barang dan jasa yang merespon kebutuhan pokok, membawa kualitas hidup yang lebih baik, meminimalkan penggunaan sumber daya alam dan bahan beracun serta emisi limbah dan polutan lebih pada siklus hidup barang dan jasa agar tidak membahayakan kebutuhan generasi mendatang[5].

Various terms have also been used to refer to consumer behavior that reflects the wider and long-term impact of consumption on society on the environment. Sciffman and Winsenblit[2], identified three types of green consumers including: first, environmental activists: "green" enthusiasts and people who adopt lifestyles and focus on health and sustainability. They look for food from farms that not only produce organic products, but also reduce water use, electricity usage, and waste. Second, Organic Eaters: concerned about looking after their own health and not so much protecting the planet. Third, economizers: experiment with buying environmentally friendly products to save money[6].

Personality: Personality according to Leon G. Schiffman and Joseph L. Wisenblit[2] consists of inner psychological characteristics that determine and reflect how we think and act[6].The inner characteristics that constitute a person's personality are a unique combination of personality factors, no two individuals are exactly the same. However, many individuals can have one or even several personality characteristics, but not others. The description can be explained that personality shows the deepest characteristics in a person and is a combination of many unique factors. Therefore, no two individuals are exactly the same characteristics. However, many individuals can have one or even several of the same personality characteristics, but the other characteristics may be different. Different personalities can be observed with different behavior from one person to another. However, marketers can identify what characteristics in consumers who influence it in buying a product. Although personality is generally permanent and consistent, in certain circumstances, personality can change.In line with the description above Frank R. Kardes, Maria L. Cronley and Thomas W. Cline also stated Personality is a set of unique psychological characteristics that influence how a person responds to his or her environment, including cognitive, affective, and behavioral tendencies[4].

Personality traits are functions of genes and the environment. An important part of the environment is the cultural equality in which you grew up. Cultural values are defined as beliefs about the desired end of a country or the manner of behavior in a particular culture.

Colquitt, LePine and Wesson in The Big Five Personality Model explains that there are five dimensions that underlie human personality, namely conscientiousness, agreeableness, neuroticism, openness, and extraversion. The five dimensions of personality can be measured through indicators: Conscientiousness (reliable, organizational, trustworthy, ambitious, hardworking and persevering). Agreeableness (kind, like to work together, sympathetic, helpful, polite and warm). Neuroticism (nervous, moody, emotional, alert, restless, irritable). Openness (inquisitive, delusional, creative, inferior, polite, smart) and Extraversion (talkative, sociable, passionate, resolute, brave, powerful)[7].

Big Five Personality is an approach used in psychology to see human personality through traits that are arranged in five personality domains that have been formed using factor analysis. The five personality traits are extraversion, agreeableness, conscientiousness, neuroticism, openness to experiences.

Gender: Gender is "A concept that refers to the social differences between women and men that have been studied, which change over time and have wide variations both within and between cultures." Gender refers to the rules, norms and practices in which biological differences between men and women, boys and girls, are interpreted so that it results in unbalanced judgments, possibilities and opportunities in life[8]

Talking about gender cannot be separated from sexual identity, and the development of gender roles also departs from sexual differences. Men and women are already different and distinguished from the beginning of their lives. Since the baby was born to earth, almost all the questions asked by parents and relatives are, first of all, "male or female?" Even before birth even parents want to ascertain the sex of their children via ultrasonography.[9].

According to Crawford, gender is a set of characteristics and traits that are socio-culturally attached to men and women. Blakemore, Berenbaum, and Liben define gender as a distinguishing characteristic between men and women that is not based on biology, and is not natural, but based on the habits or sociocultural characteristics of the societies that shape it[10].Gender is not natural, can be changed and can be exchanged from human to human depending on local time and culture. The attached characteristics or characteristics are created by the surrounding social or culture. Examples of these characteristics include; men are strong, mighty, not whiny, rational, logical, and so on. While women are weak, emotional, whiny, motherly, gentle, empathetic, caring and so on.

Methodology/Materials

This study uses survey method and ex-post facto techniques with a 2 x 2 design. The population used in this study is all students of the Jakarta State University, and the determination of faculties will be selected by purposive sampling. Whereas the outreach population is students of Food, Fashion, Makeup and Family Welfare Education Study Programs who are still registered in the even semester (104) and have graduated from the Consumer Science Course, totaling 600 students. Data analysis techniques in this study used descriptive analysis and inferential analysis. Testing the requirements analysis is done before testing the hypothesis. Hypotheses one, two and five were tested using two-way Variant Analysis (ANAVA) and hypotheses three and four were tested using the Tukey test. Before being used to test the interrelationships between variables, the data must meet the requirements of normality test and variance homogeneity test. The normality test uses the Kolmogrof Smirnov test and the variance homogeneity test uses the Bartlett test.

Measurement: Green Consumer Behavior (GCB). The instrument used to collect GCB data was measured using a Likert scale instrument with 5 answer choices: Always, Often, Sometimes, Rarely, and Never with the answer scale: Always = 5, Often = 4, Sometimes = 3, Rarely = 2, and Never = 1 for positive statements. And the scale of the answers: Always = 1, Often = 2, Sometimes = 3, Rarely = 4, and Never = 5 for negative statements.

Personality. The instrument used to collect personality data uses a Likert scale instrument with 5 answer choices. Very Accurate, Accurate, No Opinion, Inaccurate, and Very Inaccurate. Giving a score if the statement is positive then the value is 5, 4, 3, 2, 1 and if the negative statement evaluates 1, 2, 3, 4, 5.

Results and Discussion

Homogeneity variance test results using the Bartlett test showed that Ho was accepted at a significance of $\alpha = 0.05$. This means that the data variance in this study is homogeneous. From the results of testing the analysis requirements, the hypothesis testing is carried out using

two-way ANAVA. (Description of Homogeneity Test results using the Bartlett test on the A1B1, A1B2, A2B1 and A2B2 data groups

Table 1. Descriptive Statistics for ANOVA 2 DIRECTIONS(Two-Way ANOVA)

		GENDER				∑B	
		Male		Female			
PERSONALITY	ACCURATE	n =	27	n =	27	n =	54
		∑Y =	3083	∑Y =	2941	∑Y =	6024
		∑Y2 =	353045	∑Y2 =	321789	∑Y2 =	674834
		Ÿ =	114,2	Ÿ =	108,9	Ÿ =	111,6
	NOT ACCURATE	n =	27	n =	27	n =	54
		∑Y =	2937	∑Y =	2943	∑Y =	5880
		∑Y2 =	320573	∑Y2 =	322187	∑Y2 =	642760
		Ÿ =	108,8	Ÿ =	109,0	Ÿ =	108,9
∑K		n =	54	n =	54	n =	108
		∑Y =	6020	∑Y =	5884	∑Y =	11904
		∑Y2 =	673618	∑Y2 =	643976	∑Y2 =	1317594
		Ÿ =	111,5	Ÿ =	109,0	Ÿ =	110,2

The test results of the influence of Personality and Gender on the behavior of green consumers (Green Consumers Behavior) students are found in the results of two groups of different tests and interactions using the Anava test can be seen in the following table:

Table 2. Research result two-way ANAVA

Source of variance	dk	JK	RJK	Fh	Ft		
					α=0,10	α=0,05	α=0,01
Between columns (Ak)	1	171,26	171,26	3,60	2,21	2,81	4,24
Between lines (Ab)	1	192,00	192,00	4,04	2,21	2,81	4,24
Interaction (I)	1	202,81	202,81	4,27	2,21	2,81	4,24
Between groups (A)	3	566,07	188,69	3,97	2,14	2,70	3,99
In group (D)	104	4942,59	47,52	-		-	-
The total is reduced (TR)	107	5508,67	51,48	-		-	-
Average/correction (R)	1	1312085,33	1312085,33	-		-	-
Total (T)	108	1317594	-	-		-	-

First Hypothesis: Based on the results of the first hypothesis testing, it was obtained that the null hypothesis was rejected stating "there is a difference between GCB students who have Accurate Personality and Inaccurate Personality. This means that the hypothesis proposed by the researcher is accepted or there is a significant difference between the GCB of students who have Accurate Personality and Inaccurate Personality.

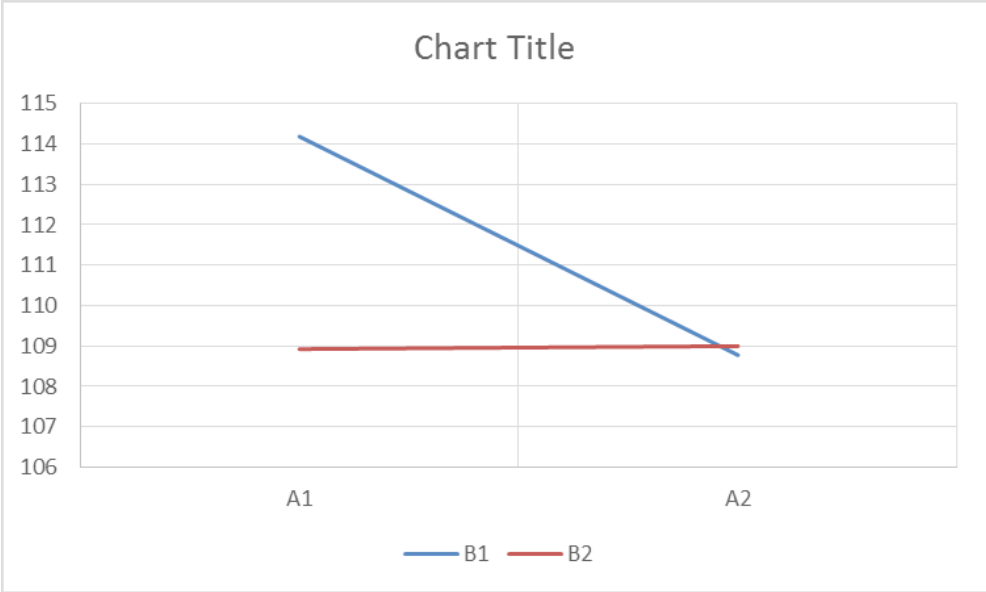
Second Hypothesis: Based on the results of testing the first hypothesis, the test results obtained that the null hypothesis was rejected stating "there is a difference between GCB for male students and female students". This means that the hypothesis proposed by the researcher is accepted or there are differences in the GCB of male students and female students.

Third Hypothesis: Ho was refused and accepted H1 or accepted the hypothesis proposed by the researcher. So it can be concluded that for male GCB students who have accurate personality are better than inaccurate personality.

Fourth Hypothesis: That Ho is rejected and accept H1 or accept the hypothesis proposed by researchers. So it can be concluded that "there is a GCB between female students who have accurate Personality better than female students who have inaccurate Personality."

Fifth Hypothesis: Ho was refused and accepted H1. This means that the hypothesis proposed by the researcher is accepted or there is an interaction between personality and gender on the behavior of green consumers (Green Consumers Behavior) students.

Picture 1. Simple Effect Graph (Simple Effect) interaction between personality and gender on green consumer behavior (Green Consumers Behavior behavior) students.



Based on similar research that is relevant that female consumers have greater environmental concern than male consumers and female consumers have a greater green product purchasing behavior on all environmental variables than men[11]. Gender factors play a very important role in purchasing decisions. Women and men exhibit both completely different behaviors when buying goods or services, whereas women are more subjective and intuitive men tend to be more analytical and logical[12]. In this study there are gender differences in men/women with GCB who have an accurate personality better than an inaccurate personality. But here personality is not influenced by gender, which means that differences in GCB are influenced by the effects of the interaction between personality and gender.

Conclusion

This study uses survey method and ex-post facto techniques with a 2x2 design that aims to obtain information about the influence of personality and gender on GCB. Based on the results of hypothesis testing can be summarized as follows: First, there is a significant difference between GCB students who have Accurate Personality and Inaccurate Personality. Second, there are differences in GCB male and female students. Third, for GCB students, male students who have accurate personality are better than those who have inaccurate personality. Fourth, there are GCB among female students who have accurate Personality better than female students who have inaccurate Personality. Fifth, there is an interaction between personality and gender on the behavior of green consumers (Green Consumers Behavior) students. Based on the above findings, in this case it can be concluded that the results indicate that personality has a significant influence in shaping GCB and found differences in GCB in male/female student groups who have accurate personality. However, personality is not influenced by gender, which means that differences in GCB are affected by the interaction between personality and gender.

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Keeping Teachers' Organizational Commitment High By Considering the Role of Teachers Leadership and Trust

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Abstract

The problem that school often faced is how to keep low or zero teachers' turn over rate meant that their organizational commitment should be maintained. It presumably was brought about where there was no trust anymore and confused teachers leadership. So, that was why this research conducted is to solve the problem, whether teachers' task performance affected directly or indirectly by leadership and trust. Around 100 senior high school biological teachers used as sample and causal survey applied. Instruments developed to measure organizational commitment (OC), teachers leadership (TL) and trust (T) and data analyzed by path analysis. Research findings showed that both of those exogen factor, teachers' leadership and trust were found to be significantly and directly affect on teachers' organizational commitment. Besides, trust was found to be good mediated factor as well. Therefore, these findings implied that in reducing teachers turn over rate in term of teachers organizational commitment would be scientifically, the role of teachers leadership and trust could be taken into account.

Keywords: *Organizational commitment, teachers leadership, trust, path analysis.*

Introduction

In 21st Century education requires students to have meaningful learning experiences. Meaningful learning in the form of scientific processes such as observing, asking questions, gathering information, associating, and communicating, in biology subjects were guided by biology teachers as facilitators in student centered learning. Teachers must meet four competencies, namely pedagogic, personality, professional, and social in realizing educational goals. Internal factors such as teacher competence were needed so that teachers can create meaningful learning opportunities for students. But other internal factors such as organizational commitment in its realization can maintain the professionalism of a teacher.

Organizational commitment was a condition of someone to side with a particular organization with the aim and desire to maintain membership in the organization[1]. Organizational commitment for a teacher has an impact on performance such as doing school work, trying to improve work performance, discipline, and creative[2]. For biology teachers, organizational commitment illustrates loyalty to the teaching profession so that actions taken by teachers aim to condition the classroom situation so that learning activities take place efficiently[3] through learning method, learning models and learning media that can motivate students. High organizational commitment to a teacher was affect by several factors including teacher leadership and trust.

Leadership was an ability to affect a group or other people to achieve the vision and goals[4]. A teacher was said to have good leadership if it can affect, direct, guide, and motivate students to be able to learn with targets meeting learning objectives[5]. Teachers who have the ability to lead (good teacher leadership) allow the emergence of a desire to contribute to the progress of an organization, so that it has a high level of organizational commitment[6]. The high level of organizational commitment was also related to the trust that teachers have.

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Trust was a mutual belief[7] in one's intentions and behavior[1]. A teacher can sacrifice all energy, thought, and time if an organization gives reciprocity to the things that have been given by the teacher, so that trust arises. The trust of the principal, coworkers, and students to a teacher will arise along with the teacher's leadership abilities[8]. Trust was realized by actions, not just words[9,10]. Teachers who have good trust allow the emergence of a desire to contribute to the progress of an organization, so that it has a high level of organizational commitment.

The two factors namely teacher leadership and mutual trust have an affect which impacts on a teacher's organizational commitment. Basically humans have different characteristics and characteristics. So for schools as an organization it was important to manage management in order to produce organizational commitment for its employees[11].

Therefore, research problems was whether teacher leadership directly affects organizational commitment through trust.

Literature Review: Before solving those problems, it should be made clear what actually meant by organizational commitment, teacher leadership, and trust.

Robbins & Judge described organizational commitment shows the partisanship of employees in certain organizations along with the goals and interests they have to maintain membership in the organization[4]. The active participation of a teacher to stay afloat in a school agency by carrying out tasks, being involved in organizational obligations, and being loyal to the organization shows the nature of organizational commitment. Form of loyalty in the form of a sense of willingness and involvement will be carried out by members of the organization[12,13].

Organizational commitment has three factors, first, there was confidence in the goals and values of the organization; second, there was a desire to do business on behalf of the organization; and thirdly, there was a desire to remain a member of the organization[14,15]. Through the factors that affect organizational commitment, divides it into three levels of organizational commitment, namely: affective commitment, normative commitment, and continuance commitment[1].

Affective commitment, referring to the wishes of members (want to do), continuance commitment, referring to the need to do it (need to do), and Normative commitment, referring to guarantees to keep working in the organization[1,16].

A teacher has a duty other than as a teacher, the teacher must also act as an educator in a school (organization). A teacher like to have the nature of a leader in himself that was useful for influencing, directing, guiding, and motivating students. Leadership was the ability to affect a group towards achieving its vision and goals[4]. Colquitt states that power and affect will create a positive relationship with organizational performance and commitment[1].

Teacher leadership can create positive relationships, thereby encouraging organizational commitment to realize organizational goals. An illustration stated by Yukl, a leader (school principal) will affect leadership behavior (teacher), thus also affecting the organizational commitment in forming an organizational integrity (school)[17].

In addition to teacher leadership, trust also has a positive affect on organizational commitment. In this case, trust refers to a person's positive expectations of others in a situation that involves risk[18] Similarly, teachers who already have the trust of the principal, fellow teachers, and students to carry the burden of responsibility and risk in providing education in schools.

Colquitt states that trust has a positive affect on commitment. Employees (teachers) will easily accept authority and have a high tendency to increase affective and normative commitment[1]. A teacher who was trusted by the principal in reality can easily have the burden of teaching responsibilities in class. This can lead to a sense of responsibility for the teacher class (affective commitment), and the feeling of a job that can guarantee the life of the teacher (normative commitment).

The leadership attitude for teachers that was manifested in reality gives birth to new responsibilities as a form of trust. Robbins & Judge states that trust was a primary attribute associated with leadership. Trust and trust-worthiness modulate the leader's access to knowledge and cooperation[4]. For a teacher, trust will arise due to the ability possessed by the teacher (teacher leadership).

Research Methodology

This research objective was to get the information about the effect of teacher leadership and trust on organizational commitment. A causal survey used by selecting 97 of biology teacher in Bekasi. There were three instrument which measured teacher organizational commitment (48 items), teacher leadership (48 items), and trust (48 items). Data analyzed by path analysis.

Results and Discussion

Considering the results of statistical calculations by applying SPSS, it was found that teacher leadership directly and significantly affected organizational commitment with a ph-coefficient of 0.688. Teacher leadership which consists of eight dimensions namely Idealized Affect, Inspirational Motivation, Intellectual Stimulation, Individual Consideration, Contingent Reward, Management by Exception (Active), Management by Exception (Passive), and Laissaze-Faire have a high contribution in influencing organizational commitment of biology teachers .

The leadership that was owned by the teacher makes the teacher can contribute both in the classroom and outside the classroom for the benefit of the school. Teacher leadership can create positive relationships, thereby encouraging organizational commitment to realize organizational goals. This result is also supported by Colquitt which found that power and if have moderate positive relationships with job performance and organizational commitment[1]. In addition, there is a relationship between teacher leadership and behavioral commitment found by Robbins & Judge and Hamzah[4,19].

In terms of organizational trust and commitment. Trust directly and significantly affect organizational commitment with a pH-coefficient of 0.727. Trust which consists of three main dimensions namely Ability, Benevolence, and Integrity has a high contribution in influencing the organizational commitment of biology teachers.

Trust built by someone can open up opportunities for various tasks and responsibilities that can be imposed, so that a person can reach the highest level of his organization and have an impact on organizational commitment[1]. This result was also supported by Rae Andre that the basis of effective communication is trust, with the trust of every individual involved in the organization will be able to form a harmonious relationship within the organization so that achieving organizational goals becomes easier[20]. In addition, there was a relationship between trust and commitment to behavior through good relations as the foundation of organizational commitment found by Buhler and Cunningham [21, 22].

Then teacher leadership directly and significantly affects trust with a ph-coefficient of 0.692 (see figure below). The leadership attitude for teachers that was manifested in reality gives birth to new responsibilities as a form of trust. This result was also supported by Robbins & Judge that trust was important for leadership[4]. For a teacher, trust will arise due to the ability possessed by the teacher (teacher leadership). If teachers cannot be trusted, it will have an impact on group and school performance.

Conclusions

The conclusions of the findings of this study were directed at increasing organizational commitment that can be empowered by considering how teacher leadership views leadership behavior, whether transformational direction or vice versa by transactional tendencies or laissaze-faire and trust, in terms of providing working hours, teaching assignments, and committees in schools. Therefore, teacher leadership and trust cannot be ignored when the performance of organizational commitment can be improved and developed by the school.

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School Culture and Job Satisfaction: Its Effecton Biological Teachers' Task Performance

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Abstract

School culture has been viewed as a vital variable in building school climate to be more condusive. Whether this factor will affect biological teachers job satisfaction and finally affect teachers' task performance was the problem of this research. A causal survey used by selecting randomly 90 senior high school biological teachers as sample. There were three instruments developed to measure teachers' task performance, school culture and job satisfaction which has been already validated. Data analyzed by regression, correlation and path analysis. Research findings showed that teachers task performance directly and significantly affected by school culture and job satisfaction as well, and based on this finding, job satisfaction was good mediated variable in connecting school culture and teachers' task performance. It was logic findings when teachers' performance expected to be more positive, all of teachers, especially biological teachers, require a positive atmosphere reflected by school culture and also to what extent teachers felt satisfied treated by the school system. Therefore, educational policy makers should pay more attention on how to improve school culture to be more conducive, teachers felt more satisfied then will have an impact on school quality reflected by teachers' task performance.

Keywords: *Task performance, school climate, school culture, path analysis.*

Introduction

Problems in the world of education in Indonesia are still quite a lot, including the quality of education. The low quality of education is indicated by an uneven education system. Many aspects support the statement, for example limited internet access, lack of cooperation between teachers, payment systems that are still far from sufficient, places to learn that are less comfortable and so on.

The quality of education is related to teacher performance. The teacher has the task to be able to change behavior and provide insights broad knowledge to students. This main task is to connect teachers with the quality of education therefore performance is related to teacher professionalism. To test the level of teacher performance the government conducts a series of tests. This test is reasonable to monitor the level of teacher quality and education quality.

Teachers are expected to have good quality performance to improve the quality of education. this can be done if there is a sense of satisfaction or pleasure of a worker from the workplace. a comfortable place to work, income suitability, colleagues and leadership regulations that are able to create a comfortable atmosphere can support the quality of work of someone.

Sometimes problems arise from the workplace. thus affecting the quality of performance. in terms of meeting job satisfaction is not only always focused on income. but other things such as rewards for job performance, assessment of objective supervisors, communication between friends or from superiors in accordance with procedures and the nature of work that makes teachers happy in carrying out their duties are considered able to improve the quality of teacher performance.

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Values and norms contained in the workplace also become an important aspect to consider. the values and norms that have been mutually agreed upon and ultimately become the hallmark of an organization are called culture. the intended organization relating to teacher performance is the school. The culture formed at school will create a climate that influences teacher performance.

Therefore, in this study, the research problem is whether the theoretical model of the effect of teacher performance (TP) on school culture is mediated by job satisfaction which is confirmed by the empirical findings model.

Before solving those problems,it should be made clear what actually meant by task performance (TP)is part of job performance, Before solving those problems. Sabine described performance as what organizations did, and did it well.[1] Thus, performance is not determined by the action itself but by the process of assessment and evaluative. In addition, only actions that can be scaled (measured) are considered performance. Colquitt, LePine and Wesson defined Performance in general as a series of employee behaviors that contribute, both positively or negatively to organizational achievement.[2] Linda performance can be defined as the skills (competencies) of someone doing central work tasks.[3]

Cook and Hunsaker[4] stated that performance is the result of research on a person's behavior as measured by his contribution to organizational goals. Furthermore, James said that a person's performance is determined by the ability and motivation to carry out the work.[5] Dale defined performance is determined by environmental factors and management behavior.[6]

Task performance is divided into routine performance and adapted performance. Known responses that occur under normal, routine or predictable ways include routine performance. Instead the employee's response to fulfilling unusual or unpredictable tasks is an adaptable performance.

Culture can be defined as a combination of values, devices, beliefs, communication, and simplification of behavior that gives direction to people.[7] Schein described culture is a collection of various values and behaviors that can be considered as a guide to success. Colquitt stated the organizational culture is the development of social knowledge in organizations concerning the rules, norms, values, attitudes and habits of employees.[1]

Djamaludin found from his research that significant relationship between organizational structure and organizational culture to teacher performance in Pesantren education system.[8] The correlation between the organizational structure with teacher performance is 0.683, and organizational culture with teacher performance is 0.749. When both variables are together correlated by teacher performance result is 0.764, and contribute to 58,4 % to teacher performance.

Thiagarajdescribed that Highly satisfied employees will exert extra effort and contribute positively to the effectiveness and efficiency of their organizations.[9] Job satisfaction will lead to better performance and the employees will be more committed towards their organization.

Mashalahmed research about organizational culture showed that Hofstede culture dimensions affect the organizational performance in telecom companies.[10] Heather R eubank found that a healthy school culture is cornerstone to successful school reform.[11] School leaders should work towards creating schools which have collaborative professional learning communities, distributed leadership models, and a high level of trust among all stakeholders in the organization.

Michael morcos (2018)[12] described that Culture-focused organisations increased their income as research showed over an 11-year period, by 682% versus 166% for organisations who did not focus on their culture. Organisations culture requires focus and attentions from leadership and should be consciously embedded in the organizational structure.

Material and Method

This research objective was to get the information about the mediated affect of task performance (TP) in influencing directly job satisfaction (JS) as mediator based on the effect of school culture (SC). A causal survey used by selecting 90 of teacher senior high school in East Jakarta. Instruments developed to measure TP (40 items), SC (30 items), and JS (30 items). TP has been measured by applying 2 dimention of task performance, such as routine task and adaptive task.

Data analyzed by correlation for items validity, alpha Cronbach for reliability and exploratory factor analysis by oblique rotation for instruments construct validity and path analysis for finding the empirical path model.

Result and Discussion

Analyzing the results of statistical calculations by applying the SPSS statistical calculation application, found that Task Performance (TP) was directly and significantly influenced by culture with a phi-coefficient is 0.290. Culture also affects job satisfaction with a phi-coefficient of 0.445 and task performance is directly influenced by job satisfaction with a phi of 0.280 (see figure 1). Task performance consists of two dimensions namely routine and adapted performance.

The variety of teacher's task performance must be seen logically from this dimention if a culture and satisfaction need to be improved towards a better which is an inevitable factor in the program to achieve organizational goals.

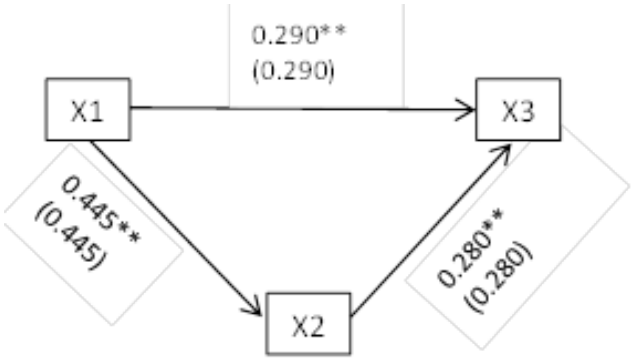

Fig. 1. Empirical model

X1 = school culture

X2 = job satisfaction

X3 = Task Performance

Genelyn R baluyos (2019)13 supported this statement with his research, The findings revealed that teachers were very satisfied with their type of work sot heir performance was very satisfying the principal's principal duties regarding supervision and job security have a significant influence. Schools must bee quipped with special waiting rooms so teachers can talk freely about their well-being. principals who were did actor were favored by the majority of teachers.

Ainun found that there was an influence on satisfaction preceded by an increase in teacher performance.[14] So it can be interpreted that the culture of school organizations has a positive influence on both the criterion variables (performance and satisfaction).

Conclusion

The conclusion of the finding of this study is directed towards improving teacher performance *(Task Performance)* which may be empowered by considering how schools culture that supports the teacher's job satisfaction. In this case there are several aspects of school culture that are mediated both by job satisfaction. Therefore school culture and job satisfaction are seen as important for improving teacher performance.

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Strategies Overcome Barrier between Doctor and Patient Communication at National Heart Institute, Malaysia

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Abstract

The relationship between doctors and patients is broadly concerned and discussed in health care aspect. The objective of this study focused on the strategies how cardiologists overcome the barrier during communicate with patients using interpersonal communication (IPC) skills. Qualitative research methodology and a phenomenological approach was applied in this study through in-depth interview and observation sessions with 8 cardiologists. The gathered data were transcribed verbatim and analysed it using ATLAS.ti7 software in the way to identified the key themes, sub-themes and inter-relationships on the quotes. The results of the study showed it is recommended a doctor should be trained on managing time while the consultation session take place with patients and for doctors' time limitation really challenge to serve the patients. Through time management training it is possible for the doctors may more effectively and efficiently communicate with patients during the consulting session.

Keywords: *Strategies, interpersonal communication skill, communication barrier, overcome, training, time.*

Introduction

Malaysia providing dual health care services through public and private health sectors. Yusuf [15] stated there were 80,691 death cases caused by heart disease in 2015 and in 2016 it was increased to 85,637 death cases reported in Malaysia. National Heart Institute (IJN) is among the leading medical institution within Malaysia which delivers advanced treatment with experienced and skilful team of cardiologists in a broad range. interpersonal communication skill becomes

an important element in health care especially as a connector between doctor-patient communication. The research took place at IJN focused on strategies to overcome barrier during cardiologists communicating with patients'. This study also looks at cardiologists' ability in conveying reliable health care information to patients in order to save and relieve patients from chronic disease.

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Literature Review:

Doctor-Patient Communication: Bredart[1] & Duffy[3] explained the doctor-patient communication is significant in health care as doctor's communication skills reflects the proficiency on collecting information to support and deliver proper health care instructions, and create concerned relationships with patients. Literature showed Street[12] doctor-patient communication is a process of exchanging information, being supportive on self-management of patients' insecurity and feelings, make decision and improving doctor and patient relationship. Undeniably, Neo[10] described communicate and building relationship with patients is one of the doctor's job scopes besides make decision on illness, therapy and treatment matter bring to the approach for a positive and efficient health care structure. Furthermore, Martin [10] stated in literature communication between doctor-patient resolve the doctors identify the patient's health issue and constructs a helpful bond between necessary for its management, possible and solution. Vermeir[13] described a well-organized communication

between doctor-patient always support patients to reach their healthcare objectives and offer them appropriate information, making significant decisions on health. Scholar Epstein[4] pointed on patient-physician relationships and the communication has given a helpful effect on the results, such as satisfaction on patient's, loyalty on suggested treatment, and self-management of prolonged illness. Scholar Levinson[8] highlighted doctor-patient communication rise doctors understanding on patients' illness wants, perceptions and principles; provide information the patients want and create confidence and understanding between doctors and patients. Kreps[6] figured out a wagon wheel with many diverse spokes represent as the characterize reliant health-care professionals and supporting staff, however the hub of the wheel symbolizes the health-care consumer, representing how the modem health-care system rotates around the consumer. Kreps [6] developed the Relational Health Communication Competence Model primarily to observe the levels of communicating proficiency between doctors-patients in health-care perspective.

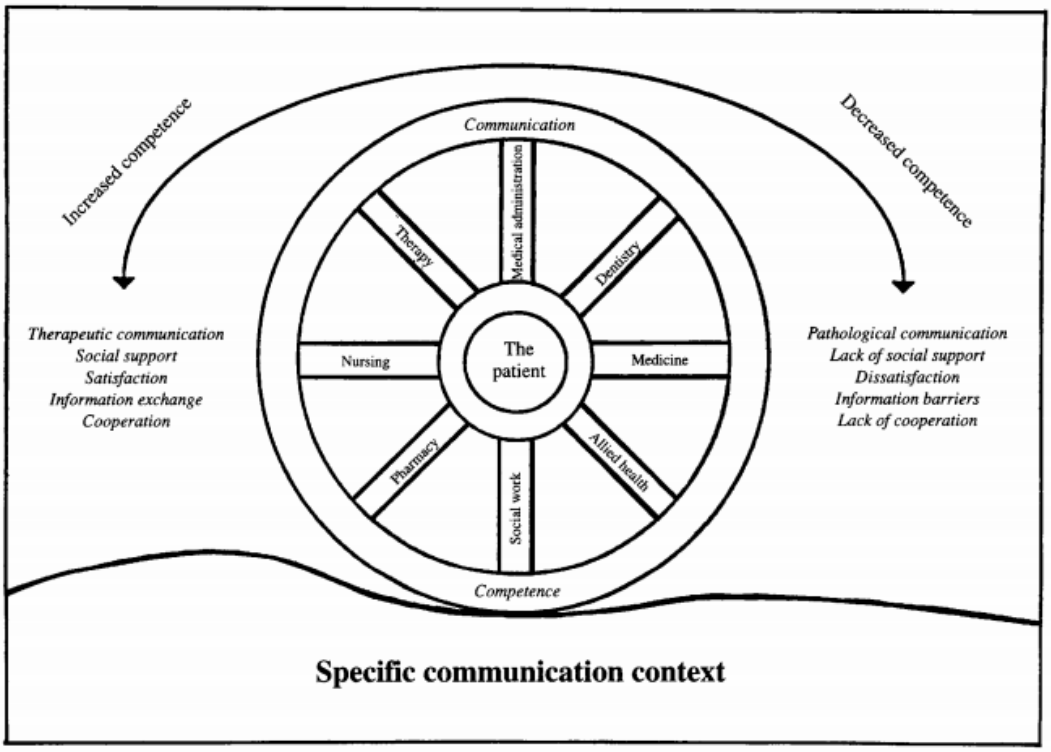

Figure 1: Relational Health Communication Competence Model (Kreps, 1984)

The model demonstrates the interdependent connections which happen among health care professionals and patients in healthcare system. Relational health communication competence is described by the example of particular provider and consumer knowledge and skills, such as empathic listening, verbal and non-verbal sensitivity, coding and interpreting skills and manage communication. In this study, the wheel rolls represent doctor–patient communication in using interpersonal communication skills in healthcare with improved personal fulfilment, therapeutic communication, support between doctors and patients, community health education, support and health-risk reduction.

Methodology

Research Design: Qualitative research method was adopted in this research via aiming on strategies to overcome barrier by cardiologists during communicating with their patients. Creswell[2] pointed qualitative research as procedure of understanding based on different methodological customs of inquiry that discover human experience. A phenomenological method was applied in

this research to illustrate occurrences in order to study a cardiologists of lived experience specifically during they communicate with patients in while talk about their diagnosed disease. Total of 8 cardiologists selected as informants and they were in-depth interviewed individually. Besides interview session, observation and audio tape recording used as triangulation method. The selection of the informants was based on purposive sampling technique with criteria of they must be cardiologists whom have several years of working experience in their field. Moreover, the cardiologists also communicating with patients and emphasis on career life experience of the cardiologists apply interpersonal communication skills during communicating with their patients.

Table 1: Summary of informants

No	Doctor's Name	Age	Race	Gender	Specialize	Working Experience (Years)
1.	Dr A	39	Indian	Male	Cardiologist	12
2.	Dr B	46	Indian	Male	Cardiologist	14
3.	Dr C	43	Chinese	Male	Cardiologist	21
4.	Dr D	37	Indian	Male	Cardiologist	15
5.	Dr E	45	Indian	Male	Cardiologist	13
6.	Dr F	42	Indian	Male	Cardiologist	13
7.	Dr G	44	Chinese	Male	Cardiologist	12
8.	Dr H	43	Malay	Female	Cardiologist	11

The interview process involved face-to-face in-depth interviews and throughout the researcher involved with informants by asking questions in unbiased and impersonal manner, listening carefully to their answers, follow-up questioning and analytical based responses. Besides interview session observational approach used to visualise and witnessed the interpersonal communication practices experiencing by the informants such as communicating with patients in terms of welcoming patient, use positive verbal and non-verbal communication, listen to the patients, show empathy, encourage discussion, counselling on patients' health related issues and recommendation on the appropriate treatment and medication process. Literature Creswell[2] supported the observation session might create deep understanding than interviews alone, as it provides facts of the context in which actions happen, and may support the researcher to observe events that participants themselves are not aware of, or that they are reluctant to discuss. All the 8 informants were interviewed and observed with average time of each session took about one to two hours in the cardiologist's clinics.

Results and Discussion

The strategies to overcome the barriers in doctor-patient communication: Communication barrier defined as whatever that blocks from effective communication process takes place. In a medical environment, there are some barrier happened in line with communication skills and patient care. The researcher identified the barriers in her previous article. This article highlighted the strategies doctors overcome the barriers during the consultation session with their patients for example, the doctor's positive response towards the patient's need on their health issues. The process of overcoming the barrier in doctor-patient communication by cardiologists is to avoid misinterpretation on the patients diagnose.

Based on the interview, the result shows that there are 8 informants that have agreed to participate in this study. Out of 8 informants there were 7 males and 1 female informants, 1 Malay, 2 Chinese and 5 Indian cardiologists participated in this study. The age group of the informants were 30-45 years old. These informants have 10 to 25 years of working experience as cardiologists. The following discussion will be on strategies the cardiologists overcoming the barriers in using interpersonal communication skill with the patients. The researcher developed the steps in overcoming the barriers through some relevant strategies such as i) communication skill; ii) communication training and iii) time management. The following discussion will be based on the general techniques for adjusting to potential barriers.

i. **Communication Skills:** This study focused doctor-patient communication specially on interpersonal communication skills used by cardiologists. Doctor's interpersonal communication skills involve the capability to collect information in order to assist defined diagnosis, appropriate counselling, deliver therapeutic guidelines, and create caring relationships with patients[1,3]. Doctors who received coaching personally are most passionate and regularly form of doctors' training and education, accomplished the greatest improvements in patient view of "excellent" associated behaviours[5]. Scholar Ranjan[11] suggested communication skills training will improve the doctors communicate well and make the patient satisfy for example listening, explanation, respecting, spend sufficient time, involving the patient in care and making decisions on the treatments procedures. Dr. B stated that communication skills should be exist within ordinary way in the way showing humanity to the patients in the way of helpful, respect, appreciate, listen to patients and have a clear understanding on what should deliver to the patients. Based on researcher's understanding, communication skills can be trained to create better doctor-patient communication which is very important to achieve successful health outcome. Training can make the cardiologists be more motivate towards the patients by following treatment recommendations and support patient's decision to be healthy and confident.

Well…. communication skills should be come in the ordinary way in terms of showing sympathy to the patients for example, feel kind, valued, understanding, listen to patients and have a clear understanding on what we should deliver (Dr B)

Another informant pointed doctor-patient communication skills can be trained in the way reflect their ability to gather information on the diagnosis and treatment (Dr H). The literature Lewin [8] supported the effective communication skills are recognized as a crucial condition for providing high excellence healthcare and person-centred care. Researcher understood that communication skills training is one of the strategy to overcome the barrier as well as it can be used to understand patient's life circumstances.

Doctor's good communication replicating their skills used for information gathering, diagnosis, treatment, and patient education. This communication skill can be effectively trained (Dr H)

Good communication skills between doctor and patient are essential for high quality, active and safe medical practice. These skills are used for gathering information, diagnosis, treatment and patient education. Dr D shared his experience that doctors' communication skills are an ability to explain and listen to patients' health outcomes. The informant also emphasized doctors need to be trained more skilful in the way to understand patients' health condition. Researcher understood that good communication skills of a doctor is a professional ethics as the nature of doctor's work and need to be competent in recognizing patients' health care concerns.

Doctors' communication skills are a capability to explain and listen on the patients' health outcomes. Doctors must be skilled to be skilful to understand patients' health condition (Dr B).

ii. **Communication Training Programs:** Communication training programmes are effective to improve doctor-patient communication of healthcare professionals. Dr G perceived communication training program can be an approach focus and train doctors to communicate well with patients. Literature Zoopi & Epstein[14]pointed communication training focus on active listening while patients tell their health history, decreasing the biomedical focus of the interview, and increasing patient participation in decision making. Based on the observation, the researcher perceived most of the cardiologists using general communication skills and the researcher also agreed with informants that appropriate communication skill training will make the doctors aware on communication skills that they use to their patients.

Communication skill training program... yes it is an approaches and it is focus on how doctors communicate and patient care. Frequent training programs have been created to make the doctors able to interact with patients using communication skills. (Dr G)

Dr C stated that communication skills can educated to the medical students as the it is a basic skill which should be included and combined in the curriculum. Furthermore, the purpose of training is to prevent misinterpretations happen in the health care practices. Research Zoopi & Epstein[14] showed doctor-patient consultation session it is highly suggested the medical professional's especially doctors would progress the

ability of understand patient's need in order to support them identify the indirectly conveyed sentiments of their patients.

Communication skills can be learned. I believe that having some basic "people skills," combined with specific interpersonal communication training; can prevent misunderstandings and malpractice suits in the career of any future doctor. (Dr C.)

From the interview session, Dr A, pointed doctor's communication skill training is strongly recommended for doctors to be more skilful in showing empathy and help to be positive emotions to their patients. Dr A also believed communication training program will be more useful for a doctors if its provided as they were a medical student. The informant also agreed communication training program trains doctors to give positive emotions towards their patients. Based on the observation, the researcher observed that cardiologist use general communication skills where listening and deliver health care information to their patients during the consultation session.

As a doctor we are trained to improve the skill such as showing empathy, help patients to be positive and identify the positive sentiments of patients. I think this will be more effective for a doctors if they learnt or trained when they as a student. (Dr A.)

iii. Time Management: Time is one of the limitation in doctor-patient communication and it includes doctor's appointment with patients such as scheduling lab tests, surgical procedures, counselling and other relevant procedures. Dr G shared his experience that he always aware on the treatment, medication and consulting session. He said with limited time he has to look up the history, chart and lab test results. He picked some specific signs from the patient and identifies them in the first few minutes and save time. Dr G thinks this comes from capability and it comes from practice and training.

I aware about patient's health condition, patient's medication and treatment process. This saves time in spending on following all extra information. I focus on certain cues from the patient and recognize them in the first few minutes. I think this comes from experience and practice. (Dr G)

Dr F identified the health information is important and he reduces disruption and forwards the questions to patients courteously. This skill is supported by self-knowledge of working with patients, comprehensive information of patients, and by medical knowledge.

Time limitation slows me down because sometimes patients want to keep ask questions about their health. When this happens, I listen to the patient's questions and response. But then sometimes yes we need to end the conversation due to time limitation. (Dr F).

Dr B shared he manage time with patients through multitasking and make his task ease such as gives medical advice, answered last questions and write prescription. Based on observation, the researcher identified the communication competent as an effective element as the doctors interact with patients with sufficient time and respond to patients' needs and concerns. Researcher observed to assess doctors' activities and time management skill was applied in their daily consultation session with their patients.

When patients leave my clinic after the consultation session, I'll make appoint walk with them until the door steps. I practice this to all my patients especially old (senior citizens) as I've developed and it allows me to get some precious times in reinforcing instructions, give guidelines, and advise the patient. For me, I manage spending quality time with my patients'. This is based on my own initiative. (Dr B)

Conclusion

The researcher identified and discussed few strategies to overcome the barrier in using interpersonal communication skill by the cardiologists with patients at IJN Malaysia. Those themes are communication skill, the communication skill training, and time management skill training for cardiology doctors. The discussed results recommended a doctor should be trained on managing time while the consultation session take place with patients and for doctors' time limitation really challenge to serve the patients. Through time management training it is possible for the doctors may more effectively and efficiently communicate with patients during the consulting session.

Conflict of Interest: Nil Source of Funding: Self source Ethical Clearance: Done research committee

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The Character Education Concept for Prospective Parents: Societal View

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Abstract

Having a strong concept of character education for prospective parents will make it easier for them to instill character education in their children later. This study aims to determine how the concept of character education that is owned by prospective parents. This study uses a survey method, which is to collect data by distributing questionnaires to prospective parents, both single and married but have no children, a total of 38 respondents are scattered in various regions in Indonesia. The results showed that (1) most prospective parents assume that character education is a family responsibility; (2) almost all prospective parents state that character education should begin at an early age; (3) most prospective parents do not yet know how to instill character education in children; (4) in general, the character values that are considered necessary are religious, honest, responsibility, and discipline; and (5) character values that are considered essential to be instilled in families in early childhood are honest, religious, and disciplined. The conclusion of this study is that prospective parents do not have a strong concept of character education. The character education model is needed by prospective parents to instill the character of children later in their family.

Keywords: *Education, character education, prospective parents.*

Introduction

Character education is essential to highlight the answers to the moral crisis problems that have occurred lately, especially in Indonesia, such as acts of intolerance, corruption, drug abuse, immorality, and other violence[1]. Moreover, Indonesia is predicted to experience a demographic bonus period in 2030-2040, namely the number of productive age population (aged 15-64 years) is higher than the population of unproductive age (under the age of 15 years and above 64 years)[2].

The character can be defined as the values of life. There are two kinds of values in life, namely moral and non-moral[3]. Moral values that are required in life are categorized as universal moral values. Based on these explanations, the character can be said to be the value or moral of life

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Character education is an effective way to enhance students' social/moral/emotional development and academic achievement[4]. Also, the results showed that there was a relationship between character education and Student Achievement and Behavioral Outcomes[5]. Character children have good tendencies for Student Achievement and Behavioral Outcomes. The importance of character education can also be seen from various studies that have been conducted, including that character education can improve social competence[6] and academic independence[7].

A study of effective character education programs shows that full parent involvement is a must[8]. Other studies have shown that parenting and parenting styles have more influence than the nonphysical environment of the school[9]. These findings reinforce the role of the family as a key to the development of children's character. Instilling character values in the family is very dependent on the ability of parents to teach these values to their children. Failure of the family in shaping the character of children will result in the growth of society that is not characterized. Thus a mature concept is needed for parents and prospective parents.

Various studies have been conducted highlighting how the efforts of parents, teachers, and schools instill character education to their children [10-14], but there are no studies that examine character education from the point of view of prospective parents, both those who are not married or those who have been married but have not been given offspring. The concept of character education for prospective parents is fundamental as capital to build character education in the family. This study provides an overview of the concept of character education for prospective parents today.

Research Method

This research uses survey method. This research was conducted in August 2019. The population of this study was prospective parents in Indonesia, while the sample used was 100 prospective parents residing on the islands of Java and Sumatra because they were considered to have represented prospective parents in Indonesia . The sampling technique used is random sampling.

To answer this research question, the data needed include (a) character education responsibilities, (b) when character education begins, (c) how to instill character education in the family, and (d) what character values are considered important to be instilled in family. The data collection technique used is by distributing questionnaires. The respondents were asked to fill in the questionnaire provided using the google form. The data received is then processed and analyzed using simple statistics, which are looking for an average of each item or indicator and described in a descriptive qualitative to interpret the data obtained.

Result and Discussion

Whose responsibility the character education?:

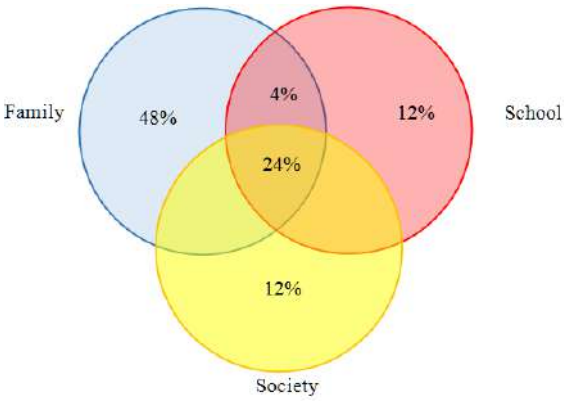

Figure 1. Diagram of the character education ersponsibility

Respondents were asked the question: "Whose responsibility of the character education?" Which was then given a choice of family, school, and/or community answers. The results showed that the majority (76%) of prospective parents consider that character education is a family responsibility, which is then followed by choice of character education answers are the responsibility of the school, family, and society (24%).

Which is interesting, some prospective parents state that character education is the responsibility of the school or community.Although the school has a central role in developing students' character, the most profound impact on students' development comes from their families[8]. Furthermore, the children's acquisition of literacy depends on a variety of strategies for working with families that are appropriate for the home environment[15].

When should the character education begin?:

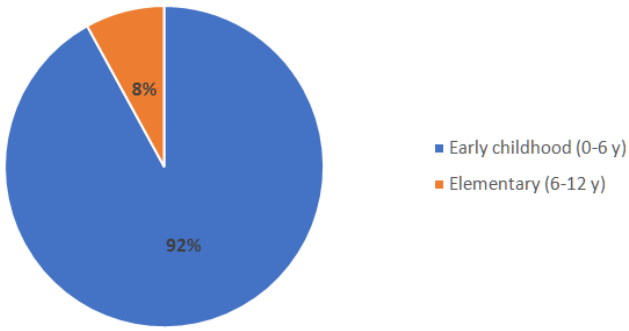

Figure 2: Diagram of the character education begin

Based on the diagram above, the results of the study showed that almost all (92%) of prospective parents stated that character education should begin at an early age, only a small proportion (8%) stated that character education should be carried out at elementary school age (6-12 years), and none of the prospective parents who stated the age of teenagers or teenagers.

These results contradict the results of a survey conducted by Primrose School, saying that nearly 50 percent of parents surveyed did not know when they could and should start helping their children develop positive character traits. Children's moral development begins in their first year of life, and brain development research shows that the first five years are a critical period to build a foundation for children's social-emotional well-being[16]. Character education indeed needs to be started as early as possible and starts from the immediate environment, namely the family. Prospective parents

in Indonesia have realized the importance of character education starting as early as possible.

How will prospective parents instill character education in children?: Although most prospective parents realize that character education is essential as early as possible, the results of the study show that most prospective parents do not yet know how to instill character education in their children later. This may be due to some prospective parents who are not married and have not thought about the concept of the family that will be built. This can also be related to the answer to the previous question which considers that character education is the responsibility of the school and/or community.

There are at least two strategies that can be done in building character education, namely: more emphasis on "stealthy" practices and more emphasis on master virtues like self-control and humility [17].Furthermore, storybooks useful and effective in terms of character education, believe that teachers should be a role model in character education, and method like drama, play, question-answer, and brainstorming are much preferred for a compelling character education[18].In addition, the provision of various learning resources that are in accordance with the conditions, styles and patterns of learning of children are needed to improve the quality of the learning process, in this case helping parents instill character in children[19]

What character values are considered essential to be instilled in the family?:

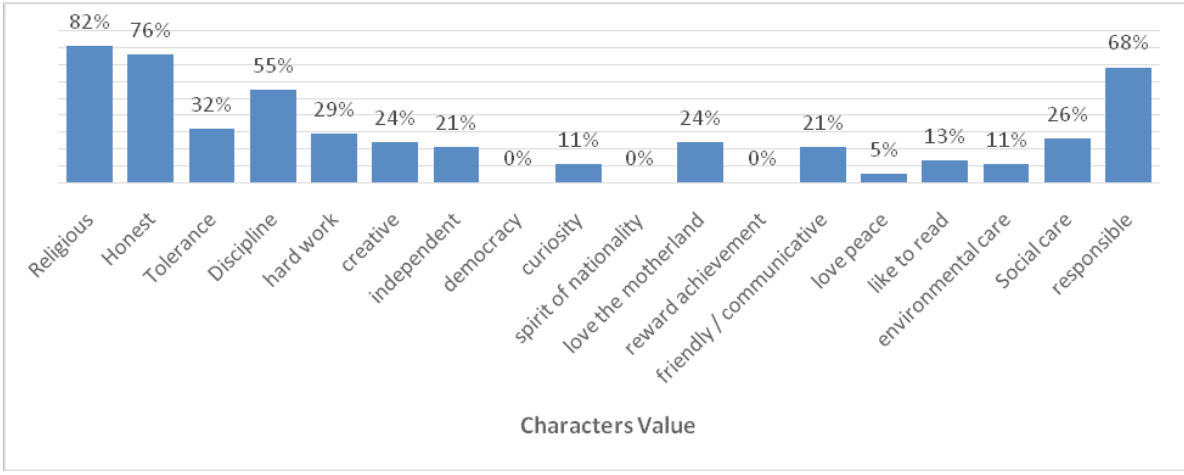

Figure 3. Characters value are considered essential to be instilled in general

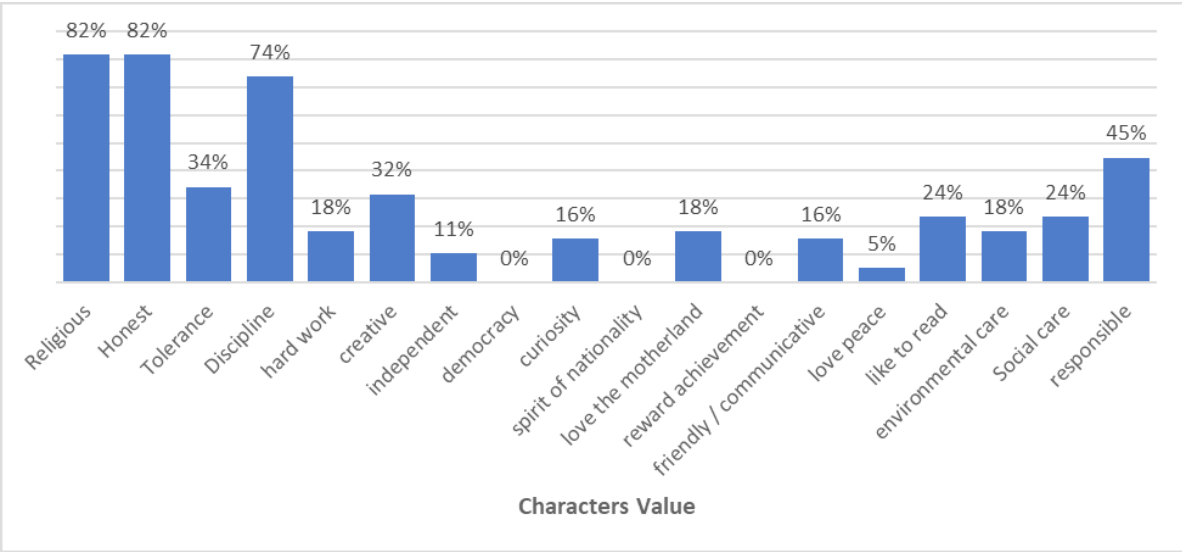

Figure 4. Characters value are considered essential to be instilled in the family

In general, the results of the study indicate that the character values that are considered necessary by prospective parents are religious, honest, responsibility, and discipline (see Figure 3). If referring to the character values that are considered essential to instill early childhood in the family are honest, religious, and disciplined (see Figure 4). Nevertheless, that does not mean that the character values other than those mentioned are not necessary, but are seen from the majority chosen. These results are in line with research conducted by Wati & Sundawa (2008) that character values that can be instilled by parents in the family are religious, honest, independent, responsible, and disciplined [20].

Conclusion

Most prospective parents state that character education is the responsibility of the family, school, and community. However, there are still a small number of prospective parents who claim character education is the responsibility of the school or community. Most prospective parents have realized that character education is essential to do from an early age, but what and how to instill character education in the family is still unclear. All of these things indicate that most prospective parents do not have a strong concept of character education. Thus, to facilitate prospective parents, an appropriate character education model is needed in the family.

Conflict of Interest: Nil

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Ethical Clearance: Done Research Committee

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Effective Communication and Collaboration Training Evaluation for Employee Performance Improvement at National Nuclear Energy Agency

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Abstract

One of the efforts done by Training and Education Centre of National Nuclear Energy Agency in improving the human resource competency is through Soft Competency Development Program that is related to the main values of BATAN. This study was aimed at describing the conceptual model of effective communication and collaboration training evaluation to improve the performance of National Nuclear Energy Agency employees. This study applied qualitative and quantitave approaches with educational research and development. The data were collected through observation, interview, and documentation study. They were applied to 25 respondents who were participants, committee, and training manager. The result showed that Effective Communication and Collaboration Training Model used management approach, which were planning, implementation, and evaluation. The things done in the planning phase were identifying the needs, determining the curriculum and training material, time and place, facilitator and training participants. In the implementation phase, four levels to be developed were reaction level, learning level, behavior level, and result level. In the evaluation phase, there were some assessments based on the indicators of Effective Communication and Collaboration to measure the performance improvement.

Keywords: *Training Evaluation, Communication, Collaboration, Performance*

Introduction

Human resource is the main key of successful nation's development. Therefore, developing the nation is a lifelong comprehensive process involving the development of every aspect and dimention of human development in many ways, especially education. Education is expected to equip every aspect of life based on the valid value and applicable norm. This is in accordance with the national education fuctions and goals as in the Indonesian Law UU No. 20 tahun 2003 about National Education System:

National education serves to develop the capability and shape the nation's chacarter and civilization to be dignified in order to educate the national. Education goal is to develop the students' potential to be religious, has noble moral, be healthy, knowledgable, competent, creative, independent, democratic, and responsible.[1]

In accordance with the definition, Zainul and Nasution (2001) stated that evaluation is a process in making a decision by using some informations attained from learning outcome measurement, whether it was by test or non-test.[2,3]

Evaluation should be carried out continuously in line with the process, result, and impacts of the non-formal education by applying systematic measurement standard.

An evaluation can utilize various approaches, method, and techniques in collecting the data to be reported to the program organizer, manager, executor, and other involved parties. It will be an input in taking a decision related to the termination, expansion,

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improvement, and the development of education program (Sudjana, 2012).[4]

Evaluation goal is to measure the training program effectivity. If the evaluation occurred, we can expect that the result will be positive. It will be the base for the leader in making some decisions. Hence, the program needs some reasoning and plans in order to be effective. The significant things in training program evaluation are reasons of evaluation and the presentation of the descriptions, guides, evaluation techniques, and suggetions about the evaluation and program implementation.

Conceptual model of effective communication and collaboration training evaluation is one of the evaluation model developed by researcher in order to improve the performance of BATAN employee.

Literature Review:

A. Concept of Evaluation: Evaluation according to Kumano (2001) is an assessment of the attained data. Zainul and Nasution (2001) stated that evaluation is a process in making a decision by using some informations attained from learning outcome measurement, whether it was by test or non-test. Therefore, evaluation is a systematic process to determine or to make a decision to what extent the teaching objectives have been achieved. [2, 3, 5, 6]

Meanwhile, Arikunto (2003) said that evaluation is a series of event that is intended to measure the education program success. He defined the evaluation as an assessment process of what extent the teaching objectives have been achieved.[7, 8]

B. Training Concept: Kllatt, Murdick & Schuster defined training as a systematic way of altering behavior to prepare an employee for a job or to improve the employee's performance on the present job, and development is preparing an employee for improving the conceptual, decision making, and interpersonal skills in complex, in structured situation. The other opinion about training is from Smith. He said training is a planned process to modify attitude knowledge or skill behavior through learning experience to achieve effective performance in an activity or a range of activities.[9,10]

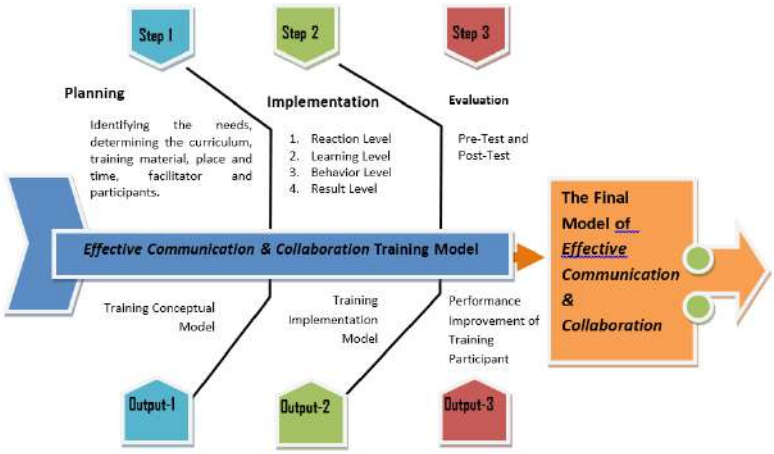
Method

The development training evaluation model was done by applying qualitative descriptive and quantitative approaches with *educational research and development* written by Borg and Gall (1983). The data were collected through observation, interview, questionnaire, and documentation. The research procedures were: 1) preliminary study. 2) Formulating the conceptual model, 3) model validation and revision, 4) limited trial (small scale), 5) Model revision, 6) model testing (field), 7) model completion/validation, 8) establishment of training model final product.[11]

In the implementation, Borg and Gall research was modified by using eight developments steps in improving the performance of BATAN employee.

Result and Discussion

Conceptual model of effective communication and collaboration training evaluation to improve employee performance of national nuclear energy agency



Source: Researcher's document (2019)

Graph 1: Conceptual Model Figure (Effective Communication & Collaboration training evaluation)

Conceptual model of effective communication and collaboration training evaluation to improve employee performance of National Nuclear Energy Agency (BATAN) was divided into three steps, which were planning, implementation, and evaluation. In association with the existing theory conception, those three steps refered to management approach as the figure explained below:

For more details, the implementation of those three steps can be explained as follows:

Planning: In the planning phase, things to be prepared were curriculum/material, theme, time (schedule), facilitator, and training participant.[12]

a. **Curriculum/Training Material:** Training were divided into two parts; main material and self-assessment material. The former consisted of: 1) *Personality Strength and Weakness*, 2) *Human Interpersonal Skill*, 3) P*erception and Communication*, 4) *Developing Productive Communication Skill, 5) Effective Team Role and Supportive Team Work*. While, the latter consisted of: 1) Personal motive analysis, 2) work motive analysis, 3) *Personality Profile DISC, 4) Belbin Team Roles.*

b. **Time:** Training was conducted on April 29th 2019 to April 30th 2019 at Pusat Pendidikan dan Pelatihan BATAN (BATAN Training and Education Centre), *Jalan Lebak Bulus Raya, Pasar Jumat*, South Jakarta.

c. **Facilitator:** Facilitator and *teaching team* of training were chosen from Animous Consulting (PT. Solusi Kinerja Prima).

d. **Training Participants:** Participants of training were the 25 employees of National Nuclear Energy Agency (BATAN) from various departments.

Implementation: Substantially, this kind of model implementation was divided into four levels. These four levels described a series of ways to evaluate the programs. Each level was important and affected the next level. As the level moved from one to another, every level became more difficult and needed more time, but that also gave some valuable information. Those four levels are:

Level 1: Reaction

Level 2: Learning

Level 3: Behavior

Level 4: Results

Reaction: In this phase, the reaction was in form of participation of BATAN employees to join the training program. There were about 25 participant taken part in this training from various departments in BATAN.

Learning: Learning was defined as educational interaction between the training participants and instructors or trainers where the participants experienced the learning process to improve their knowledge and skill as the outcome of the program.[4]

In this stage, the materials given were main material and self-assessment material. The former consisted of: 1) Personality Strength and Weakness: the participants were asked to analyse about their motive profile related to Personal Motive Analysis and Work Motive Analysis. Thus, they would understand their strengths and weakness to make an improvement and balance. 2) Human Interpersonal Skill: the participants were expected to understand about personality types of human to be able to comprehend how to give an information effectively to the listeners or interlocutors with various types of personality. 3) Perception and Communication: the participants were trained to understand someone's persception and deliver the information empathically to others. 4) Developing Productive Communication: the participants were expected to be able to improve their skill in delivering information well, understand the cause of communication failure, and overcome the different perception without causing any conflict. 5) Effective Team Role and Supportive Team Work: the participants were given some comprehension about the importance of understanding the personal and others' role in the company in order to improve the effective and condusive collaboration/cooperation. In the other side, self-assessment materials consisted of: 1) Personal Motive Analysis, 2) Work Motive Analysis, 3) Personality Profile DISC, and 4) Belbin Team Roles.

In this learning stage, Andragogy was developed because the participants were all adults. Knowless[4] explained that Andragogy was a method used for the adult learners based on their learning assumptions, experiences, learning readiness, and learning orientation. Besides, most of method used in this study were the method based on education for adult learners as follows: l*ecture, learning insight, group discussion, self test, personality profile, group profiling; and role-playing.*

Moreover, adult education (andragogy) had an important role, especially in adult learning programs

required to recognize change. Learning citizens were required to learn to recognize the changes and developments and at the same time to be able to open the opportunity to create a conception of learning based on "learning how to learn, learning how to think, learning to be, and learn revolution".[13]

This is because the adult education principles are referenced in training standards but depart from original theoretical frameworks.[14,15]

Behavior: This program had tree requirements. The first was to form the positive behavior towards the expected changes. The second was to teach the needed knowledge and skill. The third condition, the suitable scene, was related to the direct supervision to the participants. Five kinds of difference scenes were described as follows:

a. Prevension: The leader forbade the participants from doing what they considered to do related tp the training program..

b. Frightening: The leader did not say, "you cannot do it," but he made it clear that the participants should not change their behavior for it made the leader disappointed or the leader did not form the behavior as how it should be in the program.

c. Netral: The leader ignored the fact that the participants participated in a training program.

d. Supporting: The leader supported the participants to learn and apply the learning on heir work.

e. Demanding: The leader knew what the employees learned and ensured its application to their job. In many ways, learning contract had been prepared which the employee stated their agreement. This contract could be prepared in the last meeting of training and the copy was given to the leader. Leader observed that the contract had been done.[16]

The fourth condition was the appreciation. That could be intrinsic, extrinsic, or both. Intrinsic appreciation consisted of feeling satisfied and proud about the accomplishments occurred. Extrinsic appreciation was the compliment from the leader, recognition from others, and some additional bonus.

This was important for the trainer to understand these kinds of scene faced by the participant after the training. This was also significant for them to do something to know that the scene was netral or better. Conversely, there were few opportunities or there was absolutely no chance that the program would be able to complete the behavior and achieve the goal, because the participants did not try to use what they have learned. When the changes did not happen, both the participants and the leader would be disappointed.

Results

The result of the pleriminary study was defined as the final result because the participants particapted in the program. The final result can included work productivity and work improvement, quality improvement, and costs reduction. In this training, the results to be achieved were effective communication and collaboration within the company. The communication and collaboration should be able to become a culture in the workplace. The specific results to be achieved from this training were as follows:

a. Undertanding the strengths and the weaknesses through personal profile mapping related to the social motive to adapt with the work demands.

b. More understanding these aspects: perception and the nature of paradigm in interacting with other people

c. Improving communication skills in their roles and functions within the Department and between Departments in the company to facilitate the implementation of tasks.

d. Imrove the persuasion skills (to influence and to persuade) towards the others.

e. Improving the sensivity in understanding the others' *inner state* as partner in developing the effective communication and collaboration.

f. Improving the understanding and competency in i *Human Interpersonal Skills* through mastering effective communication and cooperation.

g. Understanding the role as part of organization and actualizing the role in the effective cooperation in order to build up positive and condusive collaboration.

Evaluation: Assessment phase in a training program gad a strategic position in measuring the objective achievement and it was measured with tools or instruments. Based on the evaluation results, the evaluation developed in this phase was the evaluation highlighted in e*ffective communication & collaboration.*[17,18] They

were: 1) personality strength and weakness, 2) human interpersonal skill, 3) perception and communication, 4) developing productive communication skill, 5) effective team role and supportive team work. 6) personal motive analysis, 7) work motive analysis, 8) personality profil DISC, 9) belbin team roles. Nine indicators develop in the assessment phases was elaborated into pre-test and post-test evaluation.

Based on the pre-test and post-test, the researcher obtained the data as follows: the lowest score in pre-test and post-test were 10 points and 80 points. It meant there were 70 points increase. Whilst, the highest score in pre-test and post-test were 80 points and 100 points. It showed 20 points increase. Calculating the results, the average increase in the ability of students was 27.2 points; the average of the pre-test results was 57.6; and the post-test average was 84.4 points. For more details, pre-test and post-test results can be seen in the following table:

Table 4: Pre-Test and Post-Test Results Training Effective Communication & Collaboration

PRE-TEST RESULT	POST-TEST RESULTS	INCREASE
50	90	40
50	80	30
50	80	30
70	90	20
40	80	40
70	80	10
80	80	0
60	90	30
60	80	20
70	100	30
40	90	50
50	80	30
60	90	30
60	70	10
30	80	50
40	100	60
80	80	0
70	90	20
50	80	30
60	100	40
10	80	70
80	80	0
70	90	20
60	80	20
80	80	0
1440	2120	680
10	80	0
80	100	70
57,6	84,4	
	27,2	

Source: Researcher's document (2019).

Conclusion

Development of evaluation in this model was divided in three stages, which were planning, implementation, and evaluation. At the planning stage, there were need identification, determination of training materials, time and place of implementation, determination of resources (facilitator and training participants). At the implementation stage, there were four levels developed, namely the reaction level, learning level, behavior level, and result level. Finally, in the evaluation stage, there were assessments based on effective communication & collaboration indicators that were packaged into pre-test and post-test and showed effective results in improving the performance of training participants.

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Ethical Clearance: Done Research Committee

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Impacts of Date Palm Seeds (Phoenix Dactyliferous L.) on Common Carpcyprinus Carpio L. Biological Indices and Blood Pictures

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Abstract

This study was carried out to study the effect of using date palm seeds powder as feed ingredient in fish laboratory of Animal Production Department, College of Agricultural sciences of Sulaimani University, Iraq, Using 75 common carp fingerlings weight 62±2 gm, to test the effect of three different levels of the date palm seed. The control treatment T1 with 0 gm date palm seed., (T2) with 2.5gm date palm seed, and (T3) with 5 gm date palm seed. At the end of experiment a dissection of all fish were done for study some blood parameters of tested fish showed that T1 has significant differences in Red blood cells count 2.113, hemoglobin values were high significantly in T1 and T3 with 11.575 and 11.000 respectively. Hematocrits was higher in T1 46.750 while no significant differences observed in Platelets. No significant differences were in monocytes, lymphocytes and granulocytes count among treatments. Some biological parameters studied such as Hepatosomatic index in which T2 was higher significantly 1.515, no significant ($P<0.05$) differences obtained from Spleenosomatic index, Intestine length and Condition factor, T3 was higher in Gill index and Kidney index with 3.874 and 0.576 respectively.

Keywords: *Date palm seed, Hepatosomato index, Spleen index, Intestine length index, Condition factor, Gill index, Kidney index, blood pictures, common carp*

Introduction

The proportion fish can exceed 50% of animal protein in the poorest countries, especially where other sources of animal protein are scarce or expensive[(1)]. Like other meat protein, fish protein is easily digestible and complements dietary protein (amino acids) provided by cereals and legumes consumed in many developing countries, in combination with a vegetable-based diet, fish provides a complementary effect to the essential amino acids that are present in low quantities in vegetarian diets, the beneficial effect of improved protein balance on health is obvious even when a small quantity of fish is consumed[(2)].

The results of Cerezuela et *al*., (2015) demonstrated the 35 significant alteration of the terminal carbohydrate abundance in skin mucus[(3)]. Carbohydrates more affected by experimental diets were N-acetyl-galactosamine, N-acetyl-glucosamine, galactose, mannose, glucose and fructose. IgM, peroxidase activity and protease were also significantly higher in fish fed enriched diets.

Fish fed diets contain up to 200 g kg-1 DF had similar growth Parameters in the study of [(4)]. Further increase in dietary DF to 300 g kg-1 resulted in significant retardation in all parameters. Body fat was reduced while protein, ash and moisture were increased by increasing DF level. Increasing dietary DF level caused changes in tilapia's intestinal villi, reduced dietary microbial activity and bacterial population of selected species, and produced stronger pellets.

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On contrast, Yousif*et al*., 1996 [5]reported that the growth and feed efficiency of blue tilapia (*O. aureus*) fed dates -based diets were very poor. They suggested that those ingredients are not recommended as a carbohydrate source for tilapia because they are almost entirely simple sugars, whereas tilapia is known to assimilate complex sugars more efficiently than simple sugars [6].

Materials and Method

At the end of the experimental period, all fish samples were weighed individually.

The blood samples from each fish of the different groups were collected by suction of the caudal peduncle. Whole blood samples were collected in small plastic vials containing heparin for determination of hemoglobin (Hb). The hemoglobin (%) concentrations were determined by using the hematology analyzer BC-2800 is a compact, fully automatic hematology analyzer with 19 parameters for complete blood count (CBC) test.

RBC (Red Blood Cell; 10^{12}cells/l); WBC (White Blood Cell; 10^{9}cells/l); Hb (Hemoglobin; g/l); MCH (Mean Corpuscular Hemoglobin; pg); MCHC (Mean Corpuscular Hemoglobin Concentration; g/l); MCV (Mean Corpuscular Volume; fl); GRAN (Granulocyte; %); Lymph (Lymphocyte; %); Mid (Monocyte; %); PLT (Platelet; 10^{9} cells/l).

After blood samples collection, all the fish samples were scarified and soon the abdominal cavity was opened to remove, gonads and liver and other organs to be weighed at once. The gonad and liver indices were calculated as follow according to (Lagler, 1956):

Hepatosomatic index % = liver weight (g)/body weight (g) x 100

Gonadosomatic index (GSI) % = Gonads weight (g)/Body weight (g) x 100

Spleenosomatic index= Spleen weight/body weight (g) x 100

Gill index= Gill weight/body weight (g) x 100

Kidney index= kidney weight/body weight (g) x 100

Condition factor= Fish weight/Total length3

Intestine index % = Intestine weight (g)/body weight (g) x 100

Intestine length index= Intestine length weight/body weight (g) x 100

Analysis of variance was conducted using the general linear models (GLM) procedure of XLSTAT. Pro. 7.5 One way (ANOVA). Fisher's L.S.D test's was used to compare between means of the control and experiment treatments.

Finding: The results in table (1) showed that the adding of date seeds powder in common carp diets were significant differences than control, by altering the level of date seed powder, the counts of RBC was increased. The control and the third treatment with 5gm date seed/kg diet were higher significantly than the second treatments. The HCT was higher significantly in control than other treatments. No significant differences observed in MCV and platelets counts.

Table 1: Effect of adding date seeds in common carp diets on some blood parameters

N	RBC	HGB	HCT	MCV	Platelets
T1	2.113 ±0.096a	11.575 ±0.024^{a}	46.750 ±0.065^{a}	221.850 ±0.036^{a}	46.000 ±0.432^{a}
T2	1.773 ±0.064b	9.900 ±0.077^{b}	38.150 ±0.087^{b}	215.025 ±0.037^{a}	34.250 ±0.451^{a}
T3	1.855 ±0.054b	11.000 ±0.058^{a}	40.533 ±0.026^{b}	213.400 ±0.032^{a}	41.250 ±0.293^{a}

Mean values with different superscripts within a column differ significantly (P≤0.05).

No significant differences indicated in some differential WBC counts by adding date seeds in common carp diets that showed in table (2).

Table 2: Effect of adding date seeds in common carp diets on some differential WBC counts.

	WBC	Lymphocytes	Monocytes	Granulocytes
T1	103.300 ±0.028[a]	73.400 ±0.039[a]	13.225 ±0.058[a]	13.375 ±0.158[a]
T2	106.725 ±0.029[a]	74.250 ±0.016[a]	12.775 ±0.032[a]	12.975 ±0.059[a]
T3	102.525 ±0.030[a]	74.200 ±0.060[a]	12.550 ±0.077[a]	13.250 ±0.266[a]

Mean values with different superscripts within a column differ significantly (P≤0.05).

The percent results indicated a significant increase in intestine weight index in second treatment as compared with other treatments, no significant differences observed in both intestine length index and condition factor as shown in table (3).

Table 3: Effect of date seed on some biological parameters of common carp during 70 day of rearing

	Intestine index	Intestine length	Condition factor
T1	2.735 ±0.041b	30.397 ±0.222a	1.461 ±0.041a
T2	3.167 ±0.166a	31.346 ±0.096a	1.390 ±0.063a
T3	2.799 ±0.259b	30.084 ±0.152a	1.435 ±0.032a

Mean values with different superscripts within a column differ significantly (P≤0.05).

Table (4) showed significant differences in Hepatosomatic, gill and kidney index in the additives treatments than the control, no significant observed in Spleenosomatic index among the different treatments.

Table 4: Effect of adding date seeds in common carp diets on some biological parameters

	Hepatosomatic index	Spleenosomatic index	Gill index	Kidney index
T1	1.276 ±0.112 b	0.380 ±0.336 a	3.229 ±0.085 b	0.413 ±0.205 b
T2	1.658 ±0.143 a	0.358 ±0.178 a	3.570 ±0.105 ab	0.443 ±0.320 ab
T3	1.515 ±0.182 ab	0.470 ±0.361 a	3.874 ±0. 172 a	0.576 ±0.217 a

Mean values with different superscripts within a column differ significantly (P≤0.05).

It has been suggested that the increased fiber content of date pits may reduce their quality for fish and decrease fish growth. In monogastric animals, the high fiber content of date pits was reported to cause decreased weight gain[7] . However, the low fiber content of the DP-based diets in the present study (4.3-5.7%) may exclude this assumption, since tilapias have been shown to grow extremely well at up to 5% supplemental fiber.

The date pit carbohydrates may contain amylase inhibitors, or other anti-nutrients that would reduce their utilization by tilapia. For example, [8] El-Sayed *et al.* (2000) found that wheat bran contains protease inhibitor, the activity of which may negatively affect food digestibility. Therefore, proper processing of carbohydrate sources may improve their quality for tilapia. In support, El-Sayed (1991) found that cooking sugar cane bagasse slightly improved its utilization by *T. zillii,* More recently, fermented water hyacinth was better utilized than fresh water hyacinth when incorporated in Nile tilapia diets at 20% levels, while at 10% inclusion level both fermented and fresh hyacinth were utilized equally. These results suggest that proper processing of date pits may improve their quality for tilapia[9].

A number of studies have considered the effects of processing of date pits on their quality for fish and land animals. Yet, the results have not been not encouraging. Al-Darmaki (2003) found that treating date pits with sulfuric acid, or supplementing date pits-based diets with exogenous enzymes did not improve their quality for Nile tilapia[10]. Similarly, acid treatment of date pits with sulfuric acid had no significant effect on growth performance and feed

utilization of broilers[11] or rats [12]. It is evident that other treatment and processing method must be tested.

Conclusion

Hemoglobin values were high significantly in T1 and T3 with 11.575 and 11.000 respectively. Hematocrits was higher in T1 46.750 while no significant differences observed in Platelets. No significant differences were in monocytes, lymphocytes and granulocytes count among treatments. Some biological parameters studied such as Hepatosomatic index in which T2 was higher significantly 1.515, no significant ($P<0.05$) differences obtained from Spleenosomatic index, Intestine length and Condition factor, T3 was higher in Gill index and Kidney index with 3.874 and0.576 respectively.

Conflict of Interest: Non

Source of Findings: Self

Ethical Clearance: Nil

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Evaluation of Maternal and Child Health Care Services in Health Care Centers with High Maternal and Infant Mortality Rate in Wassit Governorate, Iraq

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Abstract

Background: Maternal and infant mortality is considered an important indicator of socioeconomic and for society's level of development, as well as, an important indicator for assessing the level of health services provided system. This study aims at evaluation of maternal and child health program in health care centers with high maternal and infant mortality rate in Wassit governorate and to determine the availability, acceptability and utilization of maternal and child health care.

Material and Method: A cross-sectional study, were conducted at three health sectors in Wassit governorate that recorded the highest maternal and infant mortality rate for the last three years (2016, 2017 and 2018). Data were collected through the period starting (December 2018 -March 2019).

Results: The evaluation of MCH revealed that the level of the overall practice of antenatal care services in PHCs was fair 78.6%. Poor postpartum care was provided in 92.9% of health care centers. Poor health care services for children were provided in 67.9% of health care centers. Fair level, for immunization activities in 67.9% of health care centers and poor level concerning the practice of health education services in 85.7% of health care centers.

Conclusion: There is a shortage in the health care services provided for maternal and child at the MCH unit in the health care centers with high maternal and infant mortality rate, involved in the study.

Keywords: *Evaluation of MCH, Maternal and infant mortality, Health care centers services.*

Introduction

After the Alma-Ata Conference that held in 1978, the Mother and child care services have been announced as a key component of primary health care (PHC) [(1)]. In the arena of Public Health, the maternal and child health care services were declared as one of the most important components for saving and improving the health of mothers and child in developing and developed countries [(2)]. In the developing countries, the maternal and child health care services remain a greater challenge to the global and public health system [(3)]. Poor health practices and Lack of health care services during pregnancy and childbirth are the leading causes of maternal and infant morbidity and mortality. Complications after the obstetric period are responsible for most deformity and deaths for babies and mothers in developing countries. These constitute one of the most intractable and difficult health problems in the worlds [(4)]. According to WHO estimates in 2015, maternal mortality in Iraq fell by 53.3% over the past 25 years, with a mean annual decrease of 3.1%between 1990 and 2015. The Global Burden of Disease (GBD) estimates in 2015, under 5 years child mortality in Iraq fell by 33.5% over the past 25 years, with a mean annual decrease of 2.7% between 1990 and 2015. This indicates that Iraq has also made progress in reducing maternal and child mortality [(5)].

In Iraq, maternal care services face some obstacles common to the primary health care (PHC) system. These obstacles are mainly related to inappropriate health care service delivery including; inappropriate use of health services, poor infrastructure, poor referral system, poor hygiene and lack of management guidelines. In addition, other obstacles include workforce challenges, like the poor knowledge and qualification of health care providers, lack of continuing education training, and shortage in resources, including; low in quality of medical supplies, and shortage in resources. poor leadership and Poor information technology are also important obstacles to maternal care services [(6)].

Aims of Study: Evaluation of maternal and child health program in health care centers with high maternal and infant mortality rate in Wassit governorate, to identify the maternal health care (Antenatal and Postnatal) services.

Material and Method

The Wassit governorate is about 180 kilometers south of Baghdad city the capital of Iraq and has an area of 17,153 square kilometers, and accounts for four percent of the total area of Iraq 441,000 square kilometers. Census conducted by the central authorities in 2014 the total population of the Wassit governorate was 422 thousand inhabitants.

A descriptive, cross-sectional study was conducted in three primary health care sectors which include 28 PHC centers were selected according to its high maternal and infant mortality rate during the years 2016, 2017 and 2018.

Data collection technique: Data for PHC activities were collected by direct observation using a structured questionnaire that was adopted from Basic Health Services Package for Iraq from the Ministry of Health[(7)] and after reviewing previous studies with minor modifications.

Score for evaluation of maternal and child health care services: Assessment score of antenatal care for pregnant women consists of 18 questions was determined according to the quartile status (second, third and fourth) where those below second quartile (<36) as poor services, on third quartile (36-44) as fair and above third quartile (≥45) as good services. Scoring of the scale as (3) for always, (2) for sometimes and (1) for no.

Assessment score of postpartum care consists of nine questions the score assessment was determined according to the quartile status where those below second quartile (<18) as poor services, on third quartile (18-22) as fair and above third quartile (≥23) as good services. Scoring of the scale as (3) for always, (2) for sometimes and (1) for no.

Assessment score of the Care for children less than 5 years of age it consists of 15 questions and these score was determined according to the quartile status where those below second quartile (<30) as poor services, on third quartile (30-37) as fair and above third quartile (≥38) as good services. Scoring of the scale as (3) for always, (2) for sometimes and (1) for no.Assessment score of the Immunization activities consists of seven question the score was determined according to the quartile status where those below second quartile (<14) as poor activity, on third quartile (14-17) as fair and above third quartile (≥18) considered as good activity. Scoring of the scale as (3) for always, (2) for sometimes and (1) for no.Assessment score of the Health education Services consists of eight questions the score was determined according to the quartile status where those below second quartile (<16) as poor Services, on third quartile (16-19) as fair and those above third quartile (≥20) as good Services. Scoring of the scale as (3) for always, (2) for sometimes and (1) for no.

Statistical analysis: Data analysis was carried out by using the Statistical Package for Social Science (SPSS/version 25).

Findings:

Table 1: Evaluation of antenatal activities in studied PHC centers

Antenatal care activity	Always		Sometimes		No	
	No	%	No	%	No	%
Pregnancy test is done for each pregnant women (diagnosis of pregnancy)	2	7.1	19	67.9	7	25
When a pregnant woman visits the health center, does her weight and height measured	26	92.9	2	7.1	-	-

Antenatal care activity	Always		Sometimes		No	
	No	%	No	%	No	%
Is the pregnant woman vaccinated with due tetanus toxoid vaccine	28	100	-	-	-	-
Continue to give prophylactic doses of iron and folic acid tablets	5	17.9	12	42.9	11	39.3
Oral and dental examination in (first, second and third trimester) of pregnancy	11	39.3	7	25	10	35.7
Blood pressure measurement	25	89.3	1	3.6	2	7.1
Blood glucose measurement	3	10.7	8	28.6	17	60.7
Urine analysis	17	60.7	10	35.7	1	3.6
Screening for pregnant women such as hemoglobin, Blood Group	8	28.6	18	64.3	2	7.1
Treatment of hypertension in pregnant women	-	-	2	7.1	26	92.9
Health education about place of births, deliveries by skilled trainers.	-	-	2	7.1	26	92.9
Health education on personal hygiene and appropriate clothing during pregnancy	1	3.6	9	32.1	18	64.3
Educating pregnant mothers about proper nutrition and exercise	1	3.6	23	82.1	4	14.3
Schedule your next visit	28	100	-	-	-	-
Detection of risk factors for pregnant women and referral if required	26	92.9	2	7.1	-	-
Availability of high risk pregnant women poster	21	75	-	-	7	25
Monitoring of pregnancy during the expected delivery period	-	-	8	28.6	20	71.4
Documentation and recording	23	82.1	5	17.9	-	-
Overall evaluation of antenatal care/PHC centers (%)	Good (≥45)		Fair (36-44)		Poor (<36)	
	1(3.6%)		22(78.6%)		5(17.9%)	

Table 1 showed that all of PHCs were always vaccinated pregnant women with due tetanus toxoid. While 92.9% were always checking for weight and height. Measuring blood pressure was done by 92.9% of PHCs. The result of this study showed that the level of overall practice of antenatal care services of PHCs was fair (78.6%).

Table 2: Evaluation of postpartum maternal care in studied PHC centers

Postpartum care activity	Always		Sometimes		No	
	No	%	No	%	No	%
Giving ferrofol capsule	2	7.1	10	35.7	16	57.1
Diagnosis of anemia (laboratory) In addition to clinical diagnosis	4	14.3	8	28.6	16	57.1
Treatment of anemia	2	7.1	5	17.9	21	75
Explaining the best way to breastfeed	2	7.1	0	0	26	92.9
Postnatal check-up for baby	2	7.1	0	0	26	92.9
Care of the umbilical cord of the newborn	2	7.1	0	0	26	92.9
Provision of family planning services (contraception) and increasing awareness about using it.	0	0	16	57.1	12	42.9
Clinical examination of the mother after a week of childbirth and her discharge from hospital	2	7.1	1	3.6	25	89.3
Clinical examination of the mother after 30 or 40 days of childbirth to follow the period of puerperium	3	10.7	3	10.7	22	78.6
Overall evaluation of postpartum care/PHC centers (%)	Good (≥23)		Fair (18-22)		Poor (<18)	
	2(7.1%)		-		26(92.9%)	

Table 2 demonstrated the evaluation of postpartum care. The study showed that postnatal check-up for baby, and care of the umbilical cord of the newborn in the postpartum period were done by 7.1% of PHCs. The study showed that from 28 PHCs consisted in current study, 92.9% of PHCs were provided poor services of postpartum maternal care.

Table 3: Care for children less than 5 years of age

Postpartum care activity	**Always**		**Sometimes**		**No**	
	No	**%**	**No**	**%**	**No**	**%**
Monitor the growth and development of the newborn and record the data in the baby card	24	85.7	4	14.3	-	-
Child weight and height Monitoring and registration	25	89.3	3	10.7	-	-
Measuring the circumference of the head and arm circumference of the newborn	-	-	13	46.4	15	53.6
Measuring respiratory rate count for the child	-	-	1	3.6	27	96.4
Measuring temperature for the child	-	-	18	64.3	10	35.7
Baby Teeth Care	3	10.7	2	7.1	23	82.1
Checking for congenital malformations	1	3.6	15	53.6	12	42.9
Referral of severe cases of neonatal jaundice to the hospital	13	46.4	14	50	1	3.6
Monitoring of cases at risk from children	20	71.4	8	28.6	-	-
Integrated management of Childhood illnesses	7	25	17	60	4	14.3
Referral of cases of severe pneumonia to the hospital	9	32.1	18	64.3	1	3.6
Advise mothers about time to return their child immediately	-	-	2	7.1	26	92.9
Management of cases of diarrhea in children	2	7.1	21	75.0	5	17.9
Classification of dehydration	-	-	11	39.3	17	60.7
Provision of dextrolyte and zinc tablets	-	-	27	96.4	1	3.6
Overall evaluation of Care for children less than 5 years/PHC centers (%)	Good (≥38)		Fair (30-37)		Poor (<30)	
	1(3.6%)		8(28.6%)		19(67.9%)	

Table 3 shows evaluation of health care services for children ≥5 years, so 96.4% of PHCs were did not count respiratory rate for the child. Almost all PHCs 92.9%, 82.1% were did not advised the mothers for immediate return of their baby and not provided baby teeth care respectively.

Table 4: Evaluation of immunization activities in the studied PHC centers

Immunization activities	**Always**		**Sometimes**		**No**	
	No	**%**	**No**	**%**	**No**	**%**
Ensure vaccine availability	14	50	14	50	-	-
Routine vaccination sessions according to the Expanded Programme on immunization plan	27	96.4	1	3.6	-	-
Vaccination of high-risk groups (mothers and child).	5	17.9	16	57.1	7	25
Giving vitamin(A) capsules according to the routine vaccination schedule	27	96.4	1	3.6	-	-
Follow-up of defaults from the expanded programme on immunization	11	39.3	13	46.4	4	14.3
Follow-up immunization of pregnant women against tetanus	-	-	5	17.9	23	82.1
Documenting, monitoring and documenting vaccines in special registers	23	82.1	4	14.3	1	3.6
Overall evaluation of Immunization activities/PHC centers (%)	Good (≥18)		Fair (14-17)		Poor (<14)	
	8(28.6%)		19(67.9%)		1(3.6%)	

Table 4 represents the evaluation of immunization activities. This study showed that among the 28 PHCs, 67.9% of them have fair level, 28.6% of them have good level, and 3.6% of them have poor level.

Discussion

The overall design and strategies of MCH care programme in PHC centers in Wassit governorate was evaluated by this study.

Antenatal care services provided for pregnant women in current study were fair 78.6%, this result agree with another survey that was done in Al-Hilla City [8], which showed that the antenatal care provided for pregnant

women was fair 73.3%. A possible explanation might be due to a shortage in the females medical staff, absence of gynecologist's, long waiting time, poor attention to pregnant women, weak supervision, substandard facilities, shortage of necessary medications, shortage of equipment, device and supplies.

The current study demonstrated 92.9% of PHCs provided poor postpartum health care services for mothers. This result is agreed when compared with the finding of previous studies done in Ethiopia [9] and in Malawi [10], but there were disagreement with other published studies that were conducted in Jordan [11] and in India [12], which found that the provided postpartum services were 90.6% and 79% respectively.

High percentage (96.4%) of PHCs did not count respiratory rate for the child. These results disagreed with the finding of other study done in Salah al-Din [13], which showed that 80.4% of PHCs were count respiratory rate.

Advice of mothers is an important aspect for PHCs but in the current study demonstrated that 92.9% of PHCs did not advise the mothers to return their children immediately to the PHC, Which in line with the study that done in Baquba City [14].

The results of this study indicated that 67.9% of PHCs were fairly provided immunization activities, which seem to be consistent with other research that done in Karnataka, India [15], which found 66.6% of PHCs fairly provided immunization activities. This result differs from other published studies that were conducted in Al-Basrah [16] and in Baghdad City [17], which found 80.7% and 81% of PHCs respectively provided good immunization activities.

Conclusion

Affect the performance of the healthcare providers, either by motivating them to perform better than usual or by making them nervous, hence it may affect the results.

Conflict of Interest: None

Source of Funding: Self.

Ethical Clearance: Obtained from the ministry of health .

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Estimation of Interferon Gamma and Zinc Concentration in Serum of Cutaneous Leishmaniasis Patients in Tikrit City

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Abstract

Background: Interferon-gamma is one of the important cytokines, that has a role in the immune system of the body. Also zinc has optimal activity on the immune system and is involved in cell and tissue growth. The aim of this study is to evaluate IFN-γ and Zn concentration in the serum of CL patients and compare to control groups.

Patients and Method: A total of 96 persons were included in this study, during the period from January/2018 to the end of June/2018 in the outpatients of Dermatology Department of Tikrit Teaching Hospital. Forty eight patients with CL were included in this study, 43.75% were males and 56.25% were females. Assessment of zinc concentration by using spectrophotometer, so interferon gamma by ELISA.

Results: There was low serum zinc in CL patients comparing to control, since mean zinc concentration in patients was 9.6 µmol/I and in control was 11.4 µmol/l. Also this study revealed that there was decrease serum zinc in CL patients in contrast to control groups aged >15 years old, since mean zinc concentration in patients was 9.7 µmol/l while in control was 10.9 µmol/l. Mean zinc concentration in male patients and control were (10.0 and 11.6) µmol/l respectively . Mean zinc concentration in female patients (9.4) µmol/l while in female control is higher (10.8) µmol/l. mean serum interferon gamma is significant increase in serum patients ($P<0.01$) than control groups aged < 15 old. Since mean of IFN-γ was 0.8 IU/ml in patients and 0.5 IU/ml in control. Also serum IFN-γin patients and control groups (aged > 15 years old) were (1.0 and 0.6) IU/ml respectively. In addition to that it was found that there is significant increase in IFN-γ concentration ($P <0.01$) in male patients which was (1.1) IU/ml in comparison with the male control which was (0.6) IU/ml. Also the same thing is noticed in females. Mean IFN-γ in female patients and control were (0.7 l and 0.5) IU/ml Respectively.

Keywords: *Interferon Gamma; Zinc Concentration; Cutaneous Leishmaniasis; Tikrit City.*

Introduction

Leishmaniasis is a disease caused by protozoan parasites that belong to the genus Leishmania and is transmitted by the bite of certain species of sandfly, including flies in the genus Lutzomyia in the New World and Phlebotomus in the Old World. The disease was named in 1901 by the Scottish pathologist William Boog Leishman.[1] This disease is also known as Leishmaniosis, Leishmaniose, Baghdad boil, Oriental sore, Leishmaniasis tropica, Biskra button, Delhi boil, Aleppo boil, Kanadahar sore, black fever, Kala-azar fever, Sandfly disease, and Lahore sore.[1, 2]

Most forms of the disease are transmissible only from animals (zoo- nosis), but some can be spread between humans. Human infection is caused by a bout 21 of 30 species that infect mammals. These include *L. donovani* complex with three species (*L. donovani, L. infantum, and L.chagasi*); the *L. mexicana* complex with 3 main species (*L. mexicana*, *L.amazonensis*,

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and *L. venezuelensis*); *L. tropica* complex with three species (L. *tropica*, *L. aethiopica*, and *L. major); L. braziliensis* complex with three species (L. *braziliensis*, L. *guyanensis*, L. *panamensis*). The different species are morphologically indistinguishable, but they can be differentiated by isoenzyme analysis, DNA sequence analysis, or monoclonal antibodies.[1] Leishmaniasis is endemic in 88 countries throughout Africa, Asia, Europe, and North and South America.[3] There are an estimated 12 million cases world wide, with 1.5 to 2 million new cases of cutaneouse leishmaniasis (CL) and 500,000 cases of visceral leishmaniasis (VL).[4]

Leishmaniasis is spread by the bite of some types of phlebotomine sandflies. Sandflies become infected by biting an infected animal or man. Leishmaniasis also can be spread by blood transfusion or contaminated needles and rarely spread from a pregnant women to her baby.[5]

Infection with leishmania initiates complex cascades of events in macrophages that influence the ensuing immune response. One of the most important initial signaling events is the release of cytokines by the infected macrophage, leading to subsequent priming of Th_1 response and production of gamma interferon (IFN-γ), Interferon gamma has a pivotal role in the activation of macrophages to kill pathogens and protect the host cell from infection[6] The delayed type hypersensitivity reaction developed through infection by CL in which the ultimate effectors is activated macrophage[7]

Aim of the Study:To asses serum interferon gamma (IFN-γ) and zinc (Zn) in patients with cutaneous leishmaniasis (CL).

Materials and Method

This cross-sectional study was conducted in Tikrit Teaching Hospital in Tikrit city, during the period from January/2018 to the end of June/2018. About 96 persons were included in this study from both genders. Their ages were ranged from 3 months to 55 years. A total of 48 patients were included in this study. The patients were divided into two main groups according to their ages. First group was 15 years old or below, and the second group was more than 15 years old, 21 patients were males and 27 were females. Also Forty eight healthy individuals were taken as a control group .

Estimation of Serum IFN-γ Concentration: The ELISA technique was used for measurement of cytokines levels.[8] The kit that is used for screening human IFN-γ manufactured was provided from A BACKMAN COULTER COMPANY. The ELISA used with UV detector 450 nm, mode 380.

Estimation of Serum Zinc: Serum zinc was estimated by spectrophotometer using zinc kit (LTA SrI-via Milano). Serum zinc measured by using zinc kit. The concentration of zinc in the serum measured by the assessment of the colour density that are generated by the reaction of zinc in the samples with chromagen present in the reagent forming a coloured compound which colour intensity is proportional to the zinc concentration present Its colour intensity is determined by using a spectrophotometer.[9]

Statistical Analysis: All results were analyzed by using(Mean (Average); Standard Error; Standard deviation SD;and Student-test to compare between the means of two groups), any p-value >0.05 was considered significant.

Finding: The result of this study shows that cutaneous leishmaniasis constitute 54.2% in age group <15 years, which was higher than that in > 15 years old which was 45.8%. This relation was statistically not significant (p >0.01) as shown in table (1).

Table (1): The case of infection and control distribution according to age.

Characteristics	Control		Cases		Total	
	NO	Percent	NO	Percent	NO	Percent
≤15 years	23	47.9	26	54.2	49	51
> 15 years	25	52.1	22	45.8	47	49
Total	**48**	**100**	**48**	**100**	**96**	**100**

The data in table (2) revealed that in CL patients ≤ 15 years, the mean Zn concentration was 9.6 µmol/l, and in those patients > 15 years old, it was 9.7 µmol/l.

The mean of Zn concentration in male patients was 10.0 µmol/l and in male control it was 11.6 µmol/l. Mean Zn concentration in females patients was 9.4 µmol/l, in contrast to female control it was 10.8 µmol/l, as shown in table (3). This relation was statistically significant, (p value <0.01).

Table (2): Mean zinc concentration among different age groups.

Age	Case Definition	N	Mean	Std. Deviation	P value (df)
≤15 years	Control	21	11.4µmol/l	2.0	<0.05(44)*
	Cases	25	9.6 µmol/l	1.8	
> 15 years	Control	23	10.9µmol/l	2.2	<0.05(43)*
	Cases	22	9.7µmpl/l	1.3	

Table (3): Mean zinc concentration among different sex groups.

Sex	Case Definition	N	Mean	Std. Deviation	P value (df)
Male	Control	18	11.6 µmol/l	1.9	<0.05(36)*
	Cases	20	10.0 µmol/l	1.5	
Female	Control	26	10.8 µmol/l	2.2	<0.05(51)*
	Cases	27	9.4 µmpl/l	1.5	

The serum level of IFN-γ in CL patients was higher than that in the control. In the age group <15 years old, it was 0.81 lU/ml and 0.53 lU/ml respectively. This relation was statistically significant (p value < 0.05) as shown in figure (1). However, the serum level of IFN-γ in CL patients was higher than in control in the age >15 years old, it was 0.97 IU/ml and 0.58 IU/ml respectively. This relation was also statistically significant (P value <0.01) .

Table (4) shows mean concentration of IFN-γ in CL patients aged <15 years, was 0.8 IU/ml, while in those patients > 15 years old, it was 1.0 IU/ml. Mean concentration of

IFN-γ in male patients was 1.1 IU/ml, while it was 0.6 IU/ml in male control. It was observed that mean IFN-γ concentration in female patients was 0.7 IU/ml and in female control it was 0.5 IU/ml, as shown in (Table 5). This result was statistically significant (p value <0.01).

Table (4): Mean IFN-γ concentration among different age groups.

Age	Case Definition	N	Mean	Std. Deviation	P value (df)
≤15 years	Control	23	0.5 IU/ml	0.3	<0.05(47)*
	Cases	26	0.8 Iu/ml	0.6	
> 15 years	Control	25	0.6 IU/ml	0.4	<0.05(45)*
	Cases	22	1.0 IU/ml	0.6	

Table (5): Mean IFN-γ concentration according to sex.

Sex	Case Definition	N	Mean	Std. Deviation	P value (df)
Male	Control	21	0.6 IU/ml	0.4	<0.05(40)*
	Cases	21	1.1 IU/ml	0.7	
Female	Control	27	0.5 IU/ml	0.3	<0.05(52)*
	Cases	27	0.7 IU/ml	0.5	

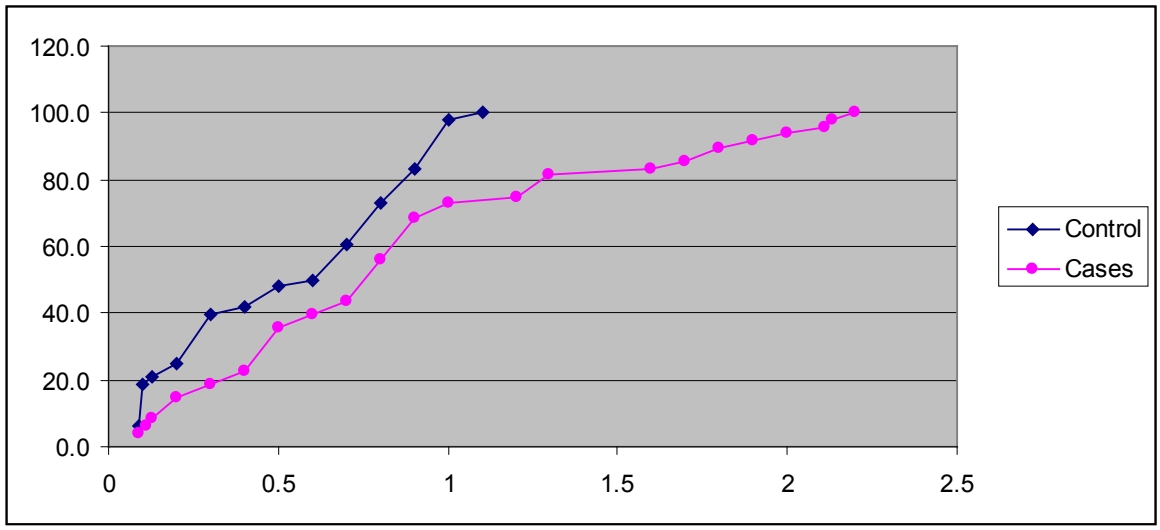

Fig (1): Distribution of IFN-γ concentration in CL patients and control groups.

Figure (1) shows distribution of IFN-γ concentration in CL patients and control groups. It revealed that in more than 20% of CL patients the IFN-γ concentration was 0.5 IU/ml, and in less than 80% of them the IFN-γ was 2 IU/ml. Also this figure shows that in more than 20% of control the IFN-γ level was 0.25 IU/ml, and in less than 80% of them the IFN-γ was 1 IU/ml.

Discussion

In this study results revealed that cutaneous leishmaniasis most commonly occurred in fifteen years and below. This result is in agreement with that found by Alrajhi AA.[10] in Turkey and Nimri et al.[11] in Jordan, because younger children have more outdoor activities like playing in the garden so they are more exposed to sandfly bites, also they discovered that older people may be more resistant to the bites of sandflies than younger children. This result is disagree with Azad thesis, [12] who found that incidence of cutaneous leishmaniasis is most commonly above 15 years, he explained that because most of them work in the farm.

Zinc is an essential trace element for all organisms. In human, body growth and development is strictly dependent on Zn. Zinc is a cofactor of more than 300 enzymes influenc sing various organ functions having a secondary effect on the immune system. Direct effects of Zn on the production, maturation and function of leucocytes. [13]

The data revealed that serum zinc concentration in all cutaneous leishmaniasis patients in different ages (< 15 years and > 15 years old) is significantly decreased ($p<0.01$). Cutaneous leishmaniasis is regarded as an infectious disease and zinc deficient peoples are more susceptible to infectious diseases. This result could be explained that CL patients might be already have Zn deficiency, therefore were infected by CL disease. Even that the decreased in Zn level in serum of CL patients might be due to defense mechanism or leishmania itself could participate in decreased of Zn level in serum through multiplication and synthesis of Zn metalloenzyme glycoproteinase (gp63), the whole surface of leishmania that consume the Zn ions from the host's cells and the cells try to substitute this consumption from the serum. [14] This is in agreement with that found by Murthy A, et al.[15] who found that Zn is required by human being pathogens for proliferation and decreasing in plasma Zn concentration during an acute phase of infection is a defense mechanism of human organisms. Regarding to Zn concentration in CL patients, the result in this study is in agreement with that found by Kocigit et al.[16,17] they found that there is decreased Zn concentrations and iron levels in serum of CL patients.

This result also agree with M. Faraydi.[18] who found that the mean concentration of zinc in serum was significantly low in CL patients, because low serum zinc play a role in exacerbation of skin infection. Also he found that low serum zinc level is correlates with the severity of the skin lesion. In addition to that patients with Zn deficiency are very susceptible to skin infections such as *Staphylococcus aures*, viral infection, parasitic infection, so that decrease serum zinc level might be

due to defence mechanism during an acute phase of infection. Most microorganisms require Zn in some amount for basic cellular processes, during the acute phase response Zn is redistributed from plasma to the liver and lymphocytes. It has been suggested that this is an adaptive response intended to deprive invading pathogens of zinc.

Serum zinc level was measured in the serum of CL patients and in the serum of control in both gender in this work. It reveals that mean serum zinc in males and females patients are slightly decrease than in control groups, so both genders are susceptible to CL. This agree with M. Faryadi, et al.[18] They explained these results due to abnormality as a result of a specific deficiency from dietary inadequacies and imbalances, and abnormality secondary to other infectious diseases. Thus, leukocyte–endogenous mediators (interleukins), released from activated phagocytic cells, induce low serum Zn by the redistribution of Zn from plasma to the liver. Decreasing serum Zn levels apparently results from the synthesis of methallothionein (MT) in liver and other tissues. Methallothionein binds 7g atoms of Zn/mol and serum to draw Zn away from free-circulating pools, this lead to low serum Zn. The thesis of Azad.[12] revealed that in males and females patients above 15 years old and < 15 years, the percent of CD_4^+ is significantly decreased than in control groups ($p<0.01$). The decrease in mean of CD_4^+ might be related to zinc deficiency and inability of CL patients to eliminate the infection.

Conclusions

Regarding to the results of this study, there were many conclusions:

1. Cutaneous leishmaniasis affects all age groups and both sexes in human.
2. All cutaneous leishmaniasis patients have low Zn level in their serum.

Ethical Clearance: No

Source of Findings: Self

Conflict of Interest: Nil

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Obesity as a Risk Factor for Disease Development: Part-I Cardiovascular Diseases and Renal Failure

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Abstract

Background: Obesity was a global healthcare problem with increase in incidence with time. Reported studies suggest an association between obesity and development of some diseases.

Aim: To clarify if there was an association between obesity and development of some diseases in an Iraqi population.

Materials and Method: A review of 3 studies which included 462 patients were performed and to compared to 342 subjects as control group. Body Mass Index [BMI], age and odd ratio mean values were determined in both groups. BMI calculated by dividing the weight in kilogram by height square in meter.

Results: Odd ratio indicated a significant association between obesity as determined by BMI and development of hypertension (P<0.0001), cardiovascular disease (P<0.001), and renal failure (P<0.001).

Conclusion: Obesity may be a risk factor for the development of cardiovascular diseases and renal failure.

Keywords: *Obesity, BMI, hypertension, cardiovascular disease, renal failure.*

Introduction

Obesity was a global healthcare problem with increase in incidence with time **(1).** A condition that was associated with metabolic, immunologic and inflammatory changes and responses that contribute to development of multiple organ diseases **(2).** Adipose tissue is not a storage site for energy, but it acts as endocrine and metabolic organ and secreted adipokines **(3,4)** The adipose tissue physiological complexity may interfere with functions and body processes through different mechanisms that included inflammatory, metabolic and immunologic changes **(5-7)** Obesity was an epidemic global health conditions with a rate of 1.9% in India to 33% in USA, which may lead to development of a chronic diseases (8). Previously reported reviews **(8-11)** suggest an association between obesity and disease development. To reveal the association between obesity and cardiovascular diseases and renal failure in Iraqi community this study was conducted.

Materials and Method

The data gathered by a review of 3 studies that included 362 patients (age range 16-86 years) and 342 control subjects (age range 14-68 years). Mean of age and BMI were calculated for each disease. The number of subjects in each group are shown in Table 1. BMI was calculated by dividing the patient weight in kg by the square of the height in meter. The study protocol was approved by Tikrit University College of Medicine Ethical Committee.

Statistical Analysis: The data were presented as mean ± standard deviation. The significance between two means were determined using student t test. The odd ratio and significance levels were determined using SPSS package [version 20].

Finding: The age mean was significantly higher in patients with cardiovascular disease (P<0001), hypertension (P< 0001) and renal failure (P<0.008)

as compared to controls. Additionally, BMI was significantly higher in patients with cardiovascular disease (P<0.0001), hypertension (P<0.0001) and renal failure (P<0.0001) as compared to controls, Table 1. As shown in Table 2, odd ratio indicated that there was a significant association between obesity and hypertension (OR=89.25; P<0.0001), renal failure (OR=4.56; P<0.001), and cardiovascular diseases (OR=3.16; P =0.001).

Table 1. BMI and age mean values in disease groups compared to controls

Disease	Group	Number	Mean [SD]	
			BMI	Age
Cardiovascular disease	Patient	172	27.70 [1.60]	52.30 [5.20]
	Control	102	24.56 [3.07]	37.02 [11.77]
	P value		<0.0001	<0.0001
Hypertension	Patient	120	36.41 [3.62]	18.60 [1.17]
	Control	140	27.32 [4.87]	17.72 [1.18]
	P value		<0.0001	<0.0001
Renal failure	Patient	170	28.77 [4.08]	49.33 [13.45]
	Control	100	23.83 [2.81]	45.04 [11.34]
	P value		<0.0001	0.008

Table 2. Odd ratio of BMI with disease development

Disease	Odd Ratio	OR 95% CI	Z value	P value
Cardiovascular	3.16	1.59-6.25	3.29	0.001
Hypertension	89.25	12.12-657.15	4.41	<0.0001
Rena failure	4.56	2.67-7.78	5.57	<0.001

Discussion

Obesity is a condition that with increased prevalence in developed and developing countries and contribute to many abnormalities that interfere with life style and disease development [9]. The present study shows a significant association between obesity and hypertension. Hall *et al.,* [10] in a review suggest the evidence that overweight was the major aetiology of hypertension and form the rate of 65% to 75% as a risk factor for essential hypertension. Kumar *et al.,* [11], in a rural community-based study, India, which included 500 subjects, found an association between obesity and hypertension. Jiang *et al.,* [12] in a review concluded that obesity is a major risk for hypertension. Sari *et al.,* [13] from Turkey reported that in intellectual disabilities adults and adolescent were with high rate of hypertension and obesity. Aronow et al., [14] reviewed 12 studies that included a large number study population suggest an association between hypertension and BMI. Price et al., [15], in a population based study in sub-saharan Africa which included 28 891 subjects found that hypertension, obesity and diabetes were common in rural and urban Malawi. Babu *et al*.,[16], in a meta-analysis systematic review that included 18 studies, reported a pooled odd ratio of 3.82 between hypertension and obesity. The induction of hypertension as a consequence of obesity may be attributed to different mechanisms that include, sodium retension, insulin resistance, kidney physical compression, rennin-angiotensin-aldosterone system activation, sympathetic nervous system increased activity, activation of mineralcorticoid receptor, brain melanocortin activation, atherosclerosis, inflammation, aletred vascular function and oxidant-antioxidant ratio disruption [10,12,17]. Epidemiological studies suggest an association between obesity and hypertension and diabetes in developing and developed countries [18]. The present study shows a significant association between obesity and cardiovascular diseases and this was in consistent with recent reviews suggestion [19-22] . Riaz *et al.,* [23] in a meta-analysis review of 4660 articles suggested that coronary artery disease and diabetes were associated with obesity, however, mendelian

randomization not prove causality, but supportive of a causal association.

Current study shows a significant positive association between obesity and renal failure. Evangelista *et al.,* [24] found an association between obesity and chronic kidney disease and loss of weight approach is effective intervention for the prevention of disease in moderate chronic kidney disease but not the severe. In literature many population-based studies reported a significant association between the progression and development of chronic kidney disease [25-37]. Although, previous studies documented the effect of obesity on chronic kidney disease, there was lower mortality in obese with end stage and advanced chronic kidney disease [29, 38-41]. Chang et al., [42], in Taiwan study which included 7357 subjects with CKD and age of 20 to 85 years, reported none significant association between chronic kidney disease progression and BMI. Some studies suggested that waist-to-height ratio was associated with progresioin of CKD and mortality rate increase in CKD rather than BMI [43-46]. Other study reported that waist circumference in women and waist-to- height ratio in men were more associated with chronic kidney disease than BMI [47]. Lu *et al.,* [37], in USA study that included 3 376 187 subjects found that BMI ≥30 was associated with rapid loss of renal function. Kim *et al.,* [48], in Korean study that included 19,331 subjects as national population reported an association between increased albumin to creatinine ratio as chronic kidney disease risk factor and obesity. Cao *et al.*, [49], in a study that included 6852 Chinese subjects found that obesity and overweight were a risk factors for a chronic kidney disease without co-existence of metabolic syndrome. Additionally, Chang *et al.,* [50], in a study that included 62 249 metabolically healthy subjects suggest that obesity and overweight are associated with increase in chronic kidney disease. Atanassova et al., [51], reported that the increase of BMI was associated with reduction in glomerular filtration rate in chronic kidney disease. Obesity lead to metabolic, structural and hemodynamic alterations in the kidney [52]. Additionally, obesity contributed to metabolic abnormalities that affect the kidney, however, the mechanisms by which chronic kidney disease induced and/or worsened is unclear [53]. Adipose tissue production of resistin, adiponection and leptin [54-56] may cause effects on kidney through increased insulin resistance, increased insulin production, rennin-angiotensin-aldosterone system activation, oxidative stress, lipid metabolism abnormality and inflammation[57-62]. Although, there was an obesity paradox in kidney disease as previous studies indicated, data consistency suggest a high biologic reasonability.[41]

Conclusion

1. The present study shows a significant association between obesity and hypertension.
2. Our results have indicated a significant association between obesity and cardiovascular diseases.
3. BMI as indicator of obesity shows a significant association with chronic renal failure.

Conflict of Interest: Non

Source of Findings: Self

Ethical Clearance: Nil

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Role of Interleukin-28B in Clearance of HCV in Hemodialysis Patients in Kirkuk City

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Abstract

Patients undergoing hemodialysis are at increased risk of infection with blood-borne viruses, especially viral hepatitis. The present study investigated these issues and the possibility of nosocomial transmission among patients undergoing hemodialysis. A cross sectional study was carried out on 200 patients with end stage renal disease (ESRD) undergoing hemodialysis (HD) and 50 blood donorsas control who admitted to blood bank in Kirkuk province from 1st of August 2018 to 1st of February 2019.

Results: The study showed that the highest rate of HCV Ab (14%) was recorded in HD patients whereas no one of control group was infected with HCV, the result was highly significant. The highest rate of HCV infection (18.75%) was found in patients with dialysis for more than 3 years.The highest mean level of IL-28 B was recorded in HD patients with HCV infection comparing with patients without HCV infection (0.097 *vs.* 0.092 pg/ml).There was highly significant relation between HCV infection and mean level of alanine aminotransferase (ALT) and aspartate aminotransferase (AST) in HD patients comparing with patients without HCV infection.

Keywords: *HCV, IL-28B, HD, HCC.*

Introduction

Patients on maintenance hemodialysis (HD) have a high risk of blood-borne viral infections. A small percentage of common viral infections are caused by hepatotrophic or other hepatitis associated viruses such as hepatitis B virus (HBV) and hepatitis C virus (HCV) [(1)].Hepatitis is acute when it lasts less than six months and chronic when it persists longer. Acute hepatitis can be self-limiting (healing on its own), rarely, can cause acute liver failure or can progress to chronic hepatitis [(2)]. The HD machine used might play a role in HCV dissemination because of accidental contamination of the membrane on the device and inadequate subsequent disinfection[(3)]. In study showed the high nucleotide similarity of HCV isolated from patients involved in the outbreak strongly indicates that the patient with previously known chronic HCV infection, who was on HD maintenance in the same room and during the same shifts[(4)].Hepatitis C virus infection is a major cause of viral hepatitis with a global seroprevalence estimated to be greater than 185 million[(5)].Extended periods of HCV infection "persistent HCV infection" may lead to cirrhosis and even hepatocellular carcinoma (HCC). Up to date, the treatment of chronic HCV infection included 6 months to 1.5-year, course of interferon-alpha in accompanied with ribavirin[(6)].

These treatments eradicate HCV infection in only 40%–50% of patients infected with genotypes 1 or 4 and 75%– 90% of those infected with genotypes 2 or 3[(7,8)]. However, adverse effects due to this treatment regimen frequently lead to poor tolerance. Among patients with chronicHCV infection, interferon (IFN)α can clear the HCV virion based on treatment in some patients. The gene for interleukin-28B (IL-28B) is found along with IL28-A and IL-29 in a cytokine cluster at 19q13.13 and codes for IFNλ3. This gene is associated with the spontaneous clearance of HCV infection and with the response to standard therapy with IFN-α and ribavirin treatment in individuals with chronic HCV infection[(9)]. Interleukin-28B locus on a human chromosomal region

mapped to 19q13 execute immune defense against viruses. During HCV infection the IL-28B has a promising role in deciding the consequence of infection for spontaneous clearance of viruses or causing chronic liver infection. Treatment of chronic hepatitis C includes use of direct acting antivirals,

Pegylated-Interferon (PEG-IFN) and Ribavirin (RBV) therapy. Numerous reports have revealed the association between certain IL-28B polymorphisms and response to the PEGIFN- RBV therapy in patients infected with HCV[10].However,recently the IL-28B genotypes were also related to hepatic fibrosisprogression in untreated patients, using the liver biopsy,that aimed to assess the role of different IL-28Bgenotypes in the liver stiffness progression in a cohort of untreated subjects affected by chronic hepatitis C[11].The present studyaimed to find the role of IL-28B in HCV infection with related clinical effect.

Method and Materials

The current study included 200 patients with end stage renal disease (ESRD) undergoing HD and 50 blood donors as a control group who were apparently healthy who admitted to blood bank in Kirkuk province in northern Iraq from 1st of August 2018 to 1st of February 2019. Blood samples were withdrawn with a vacutainer set to exclude air contamination. Serum samples were stored at -20°Cuntil processing.

Detection of HCV antibodies: Fortress diagnostics HCV kit (United Kingdom) is an enzyme-linked immunosorbent assay for qualitative detection of antibodies to hepatitis C virus in human serum or plasma. It is intended for screening blood donors and diagnosing patients related to infection with hepatitis C virus.

Detection of human IL-28B: According to manufacturer instruction, IL-28B ELISA-KOMABIOTECH, (Korea), Catalog No. K0332172, is an *in vitro* diagnostic kit for quantitative measurement of the protein from samples including serum, plasma, culture medium or other biological fluids. Human IL-28B ELISA Kit, is an enzyme immunoassay based on the sandwich principle.

Biochemical tests: Liver function tests including aspartate aminotransferase (AST), alanine aminotransferase (ALT) were performed on autoanalyzer Roche-Reflotron.

Statistical analysis: Computerized statistically analysis was performed using SPSS (Statistical Package for Science Services). Comparison carried out using; Chi-square (X^2) and probability (P value).

Finding: The present study showed that the highest rate of HCV infection(14%) was recorded in HD patients whereas no one of control group was infected with HCV. The result was highly significant..Table 1.

Table 1: Detection of HCV infection in patients with hemodialysis

Anti-HCV Ab (ELISA)	HD Patients		Control Group		P. value
	No.	%	No.	%	
Positive	28	14	0	0	0.0049
Negative	172	86	50	100	
Total	200	100	50	100	

Figure 1 In the present study, HCV infection was found in a higher rate in males (65%) than that in females (35%).

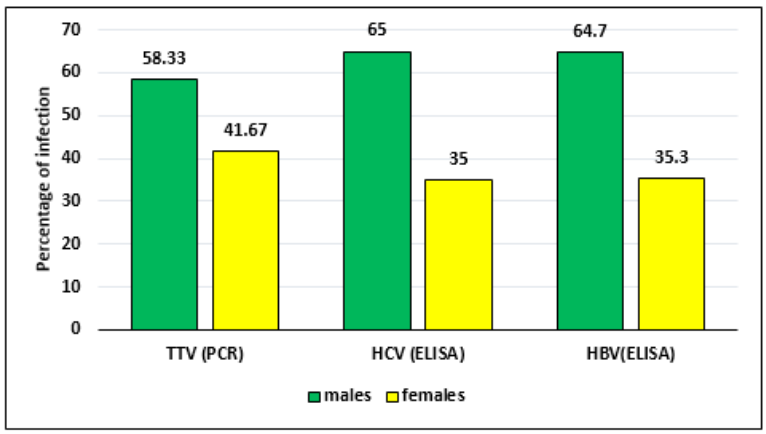

Figure 1: Distribution of HCV infection according to sex.

The present study revealed that the highest rate of HCV infection (22.22%) was found in HD patients within the age group 15-24 year followed by those within the age group 65-75 year(21.42%) and the mean age of HD patients with HCV was 49.89 year.. Table 2.

Table 2: Relation of HCV infection with age of patients under hemodialysis.

Age Groups (Years)	Total No. (200)	HCV Ab (ELISA) (n:28)	
		No.	%
15-24	18	4	22.22
25-34	20	3	15
35-44	28	5	17.86
45-54	48	4	8.33
55-64	44	3	6.81
65-75	42	9	21.42
P. value		0.26	
Mean age (years)		49.89	

The present study demonstrated that the highest mean level of IL-28 B was recorded in HD patients with HCV infection comparing with patients without HCV infection (0.097 *vs.* 0.092 pg/ml) and the lowest level was found in the control (0.055 pg/ml). The results were non-significant.. Table 3.

Table 3: Level of IL-28 B in HD patients with and without HCV infection and the control group

Level of IL-28 B (pg/ml)	HD patients		Control group	P. value (ANOVA)
	HCV +ve	HCV -ve		
No.	28	172	50	0.93
Mean±SD.	0.097±0.082	0.092±0.073	0.055±0.012	
P. value (HCV +vevs. HCV -ve): 0.94				

The study showed that the highest rate of HCV infection (18.75%) was found in patients with dialysis for more than 3 years and rate of HCV infection was increased with increasing of dialysis duration. The result was non-significant.. Table 4.

Table 4: Relation of HCV infection with duration of hemodialysis.

Duration of hemodialysis (Year)	Total No. (200)	HCV Ab ELISA				P. value
		Positive (n:28)		Negative (n:188)		
		No.	%	No.	%	
≤ 1	52	2	3.85	50	96.15	0.061
2-3	116	20	17.24	96	82.76	
>3	32	6	18.75	26	81.25	

The current study revealed that there was highly significant relation between HCV infection and Mean±SD level of ALT and AST in HD patients with HCV comparing with patients without HCV infection and the control group.. Table 5.

Table 5: Level of ALT and AST in HD patients with and without HCV infection and the control group

Parameters		HD patients		Control group (n:50)	P. value	
		HCV +ve (n:28)	HCV –ve (n:172)		(ANOVA)	HCV +vevs. HCV –ve
ALT* (IU/ml)	Mean±SD.	27.63±22.4	11.60±4.13	10.17±2.89	0.0001	0.0001
AST** (IU/ml)	Mean±SD.	27.31±15.7	11.7±7.51	10.41±2.42	0.0001	0.001

* ALT: Alanine aminotransferase.** AST: Aspartate aminotransferase. ***Normal Range ALT& AST (<20 IU/ml).

Discussions

Viral hepatitis is a clear threat in our country, especially viral hepatitis C that is considered low intensity in Iraq [12].Hepatitis C virus infection remains a burden and a risk of chronic hemodialysis population and significantly increases the risk of death. Diagnosisof HCV infections in acute phase are pivotal for providing prompt antiviral treatment to minimize the impact of the infection. Early detection of HCV infection is also pivotal for the prevention of further spread of infection in vulnerable hemodialysis patients who experience multiple invasive procedures [13]. The present study showed that the highest rate of HCV infection (14%) was recorded in HD patients whereas no one of control group was infected with HCV (P<0.01). Our findings were in agreement with Martins *et al*[14]who reported that the prevalence of HCV infection in hemodialysis patients was almost eight times greater than that observed in blood donors from the same region. On the other hand, Ibrahim *et al*[3] reported that the prevalence of HCV in HD patients was 59% compared with (14%) in control group.

The present study revealed that the highest rate of HCV infection (22.22%) was found in patients within the age group 15-24 year. An overall prevalence of 25.3% of HCV infection was reported among hemodialysis patients in the Middle-East region. This might be due to higher rate of renal diseases in older ages [15]. In the present study, HCV infection was found in a higher rate in males (65%) than that in females (35%), this result is in agreement with Ibrahim *et al* [12] who reported that men who were on maintenances dialysis units were more likely to have HCV infection (58% men) than women. The reasons for the predominance infection in men may be due to the fact that men are at greater social risk in our societies [16].

The present study showed that the highest rate of HCV infection (18.75%) was found in patients with dialysis for more than 3 years. Patel *et al* [17] found that HCV was present in patients with hemodialysis for more than 6 months and not detected in patients with hemodialysis every 20th day.Jadoul*et al* [18] reported that longer dialysis duration was correlated positively with hepatitis B and C infection.In individuals who present with spontaneous viral clearance, the immune response is mediated by pro-inflammatory components of type 1 immunity, the type III interferon class in particular, which includes IL-29, IL-28A, and IL-28B. These cytokines exhibit significant antiviral, antiproliferative, and anti-tumor activity and are expressed by mononuclear cells, monocyte derivatives, and dendritic cells when viral infection occurs [10]. The present study demonstrated that the highest mean level of IL-28 B was recorded in HD patients with HCV infection comparing with patients without HCV infection (0.097 *vs.* 0.092 pg/ml). The present study is in agreement with the results of Abe *et al*[19] who establish that the serum IL-28B levels were declined in HCV-infected patients. Other study reported that levels of IL-28B together with the combination therapy would enable clearance of the virus and the expression levels of IL-28B in liver are lesser in PEG-IFN-treated patients having rs8099917 TT genotype.

The current study revealed that the highest mean level of ALT and AST were recorded in HD patients with HCV infection, the result was highly significant. Previous study found that most of patients with HCV had ALT and AST with in normal range, indicating that liver enzyme incases of viral hepatitis on hemodialysis who had low or normal values were not good indicator or not sensitive markers for ongoing HCV and HBV replication[20,21,22].Duong *et al* [13] reported of all 201 patients undergoing hemodialysis, levels for AST and ALT were within normal range and were not different between patients with and without HCV.

Conclusion

The current study revealed an important role of IL-28B in HCV infection, which was supported by many independent studies. Interleukin-28B genotyping may be use as predictors of response for IFN-based therapy and personalized treatment of hepatitis C patients.

Ethical Clearance: Non

Conflict of Interest: Nil

Source of Funding: Self

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Levels of Interleukins Associated with Retinopathy in Sera of Iraqi Diabetic Patients

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Abstract

The current study was carried out in Baghdad-Iraq from March to November 2018 and included 110 participant (50 patients with diabetic retinopathy, 35 without diabetic retinopathy and 25 healthy control). Diabetic patients who attended who attended specialized center for Endocrinology and diabetes in Baghdad city, all diabetic retinopathy were diagnosis by specialist ophthalmologist, control group was from blood donors who haven't any chronic disorders. Patient other ocular, patients with previous vitrectomy, other ocular surgery were excluded from the study. Blood sample were collected from each participant in the study for determination of HbA1c, Interleukin-12 and IFN- γ levels. The study demonstrated that 29 (58%) of patients with diabetes retinopathy were males compared with 21(42%) were females, 15(42.86%) of diabetes patients without retinopathy were males compared with 10(57.14%) were females, so mean age of diabetes retinopathy patients was 55.5±1.1 year while 42.8±2.1 year in diabetes without retinopathy (P<0.01). The study found that of 28 (56%) of patients with diabetes retinopathy were suffered from type I diabetes compared with 22(44%) were with type II diabetes, and found that 6 (24%) of diabetes patients without retinopathy were with type I diabetes compared with 19 (76%) were with type II diabetes (P<0.01). The Group 1 shower highest mean of duration of diabetes (15±4.2 year) compared with Group 2 (9.1±5.2 year) (P<0.01). The study also demonstrated that mean of HbA1c was significantly (p<0.00 elevated in Group 1 followed by Group 2 and the lowest mean was in the control group (Group 3). The study found that interleukin-12 level was significantly elevated (P<0.01) in patients with diabetes retinopathy (44.03±15.12 pg/ml) followed by diabetics without retinopathy (40.01±22.3 pg/ml) and the lowest mean was in the control group (23.05±2.1 pg/ml). The highest mean of IFN-γ was in diabetic retinopathy (39.21±2.3pg/ml) followed by diabetics without retinopathy (23.22±2.99 pg/ml) and the lowest mean was in the control group (8.92±1.8 pg/ml) (P<0.01).

Keywords: *Diabetic retinopathy; IL-12; IFN-γ; Type II DM, Type I DM.*

Introduction

The term; diabetes mellitus (DM) is the most cause of mortality and first public problem of human disorders in the world [(1,2)]. Daily activities, obesity and elderly are the predominate risk factors of this disorder. Thus, the increase in DM numbers globally, may reach two thousands or more[(3)]. Additionally, diabetes mellitus have several consequences and complications like Diabetic retinopathy (DR), a visual defect accompanied with blindness which occur mainly active age in developed countries[(4)]. The rate of DR occurrence in the world is related to duration of diabetes in certain patients, i.e: the DR rate is low in first age of DM, but when DM extended to several decades may lead to retinopathy[(5)]. Individuals with new diagnosis with

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type 2 diabetes (T2D) may affected directly with DR or may stay years to be with DR, eventually nearly 60% of T2D patients will suffered from DR in their elderly[1]. Thus, the pivotal efforts to diagnose and management of DR is one of public strategies toward these problems in the world. Moreover, DR is developed defect of microaneurysms accompanied with small hemorrhages which may lead to some complications like "retinal ischemia", "permeability", and "neovascularization"[7]. Ischemic progressions lead to damage of neurons which have the vital role in developing of ischemia in retinopathy because of its important role blockage of blood capillaries and impermeability of retina. Inflammation of the area of retina are occur after little time of ischemia, especially in the glial tissues of retina [8]. In opportunity, the inflammations provoke these tissue cells :glia cells" to produce abundant types factors characterized with cytotoxicity, and these immune factors mainly the first cause of destruction of blood-barrier and releasing of further glial cells and leucocyte [9]. These cellular compartments and immune factors are the principal cause of inflammatory features of DR due to induction of ischemia injury of retina [10,11].

Neovascularization is principal feature of DR pathogenesis which occur after inflammatory reaction. One of causes of vascular permeability is the vascular endothelial growth factor (VEGF) which is assumed as the regulator key of DR [12,13,14]. Recently, some facts accompanied with VEGF explain the progression of retinopathy. These factors which produced- as mentioned above- by cells (gangelial cells) which found inside the tissue retina of diabetic animal, examples of that factors (pro-inflammatory cytokines, interleukin (IL)-12 and interferon (IFN)- γ[15]. Hence, these cytokines are essential in consequence of DR occurrence and development and paly a central role in pathogenicity in several DM associated diseases[1]. In regarding the diabetic retinopathy (DR) and other related diabetic complications, the elevated levels of these inflammatory cytokines are some of important aims for clarification nowadays [1,10]. Some speculation is the significant role of reduction in of tyrosine phosphorylation lipoprotein as well the elevation of Interleukin-4, IL-10 and IL-12 in the development and advancement of retinopathy in diabetes mellitus patients, which are detected by several way including enzyme immune assays[12]. The identification of such factors may contribute to clarify the exact process of inflammation processes in development of DR in DM patients [16]. However, till now, extra efforts was paid to view full role of other inflammatory factors in DR [17]. So, the study intended to determine interleukin-12 and IFN- γ levels in patients with diabetic retinopathy.

Patients and Method

This cross-sectional study was conducted in Baghdad city-Iraq from March to November 2018 and included 110 participant distributes as in Table 1, 50 patients with diabetic retinopathy, 35 without diabetic retinopathy and 25 healthy control. Diabetic patients who attended specialized center for Endocrinology and diabetes in Baghdad city, all diabetic retinopathy were diagnosis by specialist ophthalmologist control group was from blood donors who haven't any chronic disorders. Patient other ocular, patients with previous vitrectomy, other ocular surgery were excluded from the study. Blood sample were collected from each participant in the study for determination of HbA1c (Immunofluorscence, iChroma, Korea) and Interleukin-12 and IFN- γ by ELISA (Koma-Bioteck USA).

Statistical Measurements: The program (SPSS, ver 23.1) was used in this study for determination of P. value ($p<0.01$ highly significant, ≤ 0.5: significant and >0.05: non-significant (NS)).

Finding: The current study included 110 participant, distributes as in Table 1, 50 patients with diabetic retinopathy, 35 without diabetic retinopathy and 25 healthy control.

Table 1: Distribution of patients of the studied group

Studied Groups		No.	%
G1	Diabetic retinopathy	50	45.45
G2	Diabetic without retinopathy	35	31.82
G3	Control group	25	22.73
Total		**110**	**100**

$P < 0.05$

The study demonstrated that 29 (58%) of patients with diabetes retinopathy were males compared with 21(42%) were females, 15(42.86%) of diabetes patients without retinopathy were males compared with 10(57.14%) were females,mean age of patients with diabetes retinopathy was 55.5±1.1 year while 42.8±2.1 year in diabetes without retinopathy ($P<0.01$) (Table-2).

Table 2: Distrbution of studied groups according to sex and mean age

Parameter		G1 (n:50)	G2 (n:35)	G3 (n:25)	P. value
Gender	Males n (%)	29 (58%)	15 (42.86%)	15 (60%)	NS
	Females n (%)	21(42%)	20 (57.14%)	10 (40%)	
Age (mean±SD) (yrs)		55.5±1.1	42.8±2.1	30.5±1.3	<0.01

The study found that of 28 (56%) of patients with diabetes retinopathy were suffered from type I diabetes compared with 22(44%) were with type II diabetes, and found that 6 (24%) of diabetes patients without retinopathy were with type I diabetes compared with 19 (76%) were with type II diabetes (P<0.01). The Group 1 shower highest mean of duration of diabetes (15±4.2 year) compared with Group 2 (9.1±5.2 year) (P<0.01). The study also demonstrated that mean of HbA1c was significantly (p<0.00 elevated in Group 1 followed by Group 2 and the lowest mean was in the control group (Group 3) Table 3.

Table 3: Relation of diabetes types, diabetes duration and HbA1c levels with diabetic retinopathy.

Studied Groups	Type of Diabetes		Duration of Diabetes (Yrs)	HbA1c (Mean±SD)
	Type I n(%)	Type II n(%)		
Group 1	28 (56%)	22 (44%)	15±4.2	8.1±1.2
Group 2	6 (24%)	19 (76%)	9.1±5.2	7.2±0.9
Group3	0	0	0	4.1±0.3
P. value	<0.01		<0.01	<0.01

The study found that interleukin-12 level was elevated in significant level (P<0.01) in patients with diabetes retinopathy (44.03±15.12 pg/ml) followed by diabetics without retinopathy (40.01±22.3 pg/ml) and the lowest mean was in the control group (23.05±2.1 pg/ml) (Table 4). Additionally, The maximum mean of IFN-γ was in diabetic retinopathy (39.21±2.3pg/ml) followed by diabetics without retinopathy (23.22±2.99 pg/ml) and the lowest mean was in the control group (8.92±1.8 pg/ml) (P<0.01).

Table 4: Level of Interleukin-12 and IFN-γ in sera of study groups

Studied Groups	Interleukin-12 (pg/ml) (Mean±SD)	IFN-γ (pg/ml) (Mean±SD)
Group 1	44.03±15.12	39.21±2.3
Group 2	40.01±22.3	23.22±2.99
Group3	23.05±2.1	8.92±1.8
P. value	<0.01	<0.01

Discussion

In comparison with our findings with other studies, it is found in a study Nis-France; Out of 600 patients with diabetes, 52.33 % were males and 47.67% were females, mean age 61.2 years [9]. In comparison, in study done in Turkey; the mean age of DM was 57.1 year and Two thirds of patients had type II diabetes [10]. In one study done previously on patients with diabetes, it showed that, 50 years was the mean age of DM onset and T2D formed 33% of these patients [11].

Expression of INF-γ was increased in significant level in DR patients with no change was occurred on IL-6 levels in patients with DR group and the elevation in INF-γ was found in patients with proliferative DR[13,14]. Likewise, in experimental models, an increase in INF-γ expression was observed actually when using of streptozotocin injections in retina of lab mice to induce diabetes[15,16]. During the development of DR, pro-inflammatory INF-γ is well known to increase the endothelial permeability after induction of vascular dysfunction and activation of caspase-3[15]. Interestingly, other studies done earlier, demonstrated that, the different links occurred between IL-12 and to the progression of T2D, like metabolic reparation, ß-cell dysregulation and insulin resistance and suggested a positive association with retinopathy [18,19]. In the past decades, the fact the DR

was formed due to inflammatory reactions, as the retina is one of sequestered a tissue of immune surveillance. However, the distinctive clinical inflammation features of DR, like formation of edema. But in reverse to past thoughts, increase production of iCAM protein by pathway of VEGF in DR patients is a signal immune cells contribution[20]. Moreover, one study reported that elevation of serum IL-12 was associated with DR pathogenesis and in patients with T1D while it hasn't studied in proliferative retinopathy of patients with diabetes yet [23]. The highly relation of DR with duration of DM, this findings was agreed Jenchitr *et al* [24] who found a significant relation of DR with the duration of DM, they found that, the retinopathy in DM patients varied from 13.1% to 22.91% in diabetic patients with up to ten years and 42.86% in those with diabetic for as much as 20 years. Additionally, Krishnaiah *et al* [25] also found the prevalence of DR was(2.42)% in persons with diabetes intended for less 10 yrs and up to 12.20% for those along with diabetes for up to be able to 20 years. McCarter *et al* [26] indicated that, the acute occurrence of DR was simply linked with a extended period of diabetes connected positively to higher glycosylated hemoglobin levels and indicated that diabetics with higher HbA1c had three times greater risk of retinopathy.

Conclusion

High elevated levels of both INF-γ and IL-12 were present in patients with retinopathy.

Conflict of Interest: Non

Source of Findings: Non

Ethical Clearance: This research was carried out with the patient's verbal and analytical approval before the sample was taken.

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Prevalence of Celiac Disease among Cases of Irritable Bowel Syndrome in Baghdad, Iraq

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Abstract

Celiac disease is a common illness need not to be mistaken as IBS or GI motility disorders and careful evaluation of IBS patients especially those with diarrhea predominant type may need to be considered.

This study disclose that about more than 12% of patients who had been already diagnosed as IBS is discovered to have positive serology of gluten sensitivity and the diagnosis of Celiac disease had been confirmed by histopathology study.

Though and careful evaluation of presumed cases of IBS especially those with poor response to conventional therapy or those who with atypical presentations is essentialin order to reach to an alternative diagnoses.

Keywords: *Celiac disease, Gluten sensitivity, Irritable bowel syndrome, Anti tissue transglutaminase, Gluten free diet.*

Introduction

Celiac disease is a common cause of malabsorption of one or more nutrients. Recent observations have established that it is a common illness with protean manifestations, a worldwide distribution is approximately 1%.[1]

Its incidence has been raised over the past five decades. Celiac disease has several other names, as nontropical sprue, celiac sprue, and gluten-sensitive enteropathy,the etiology of celiac disease is not completely understood, but immunologic; environmental; and genetic factors imply the major role in pathogenesis.

Celiac disease is considered an "iceberg" disease. A few number of patients have classic symptoms and manifestations linked to micronutrient malabsorption along with a varied natural history; the onset of symptoms can occur at all points of life, though the disease has two peaks of ages: the first is early in life, at approximately 2 years of age (after gluten containing diets has been introduced), or later in the second to fourth decades of life. It may first manifest after an attack of prolong diarrhea following gastroenteritis or even after abdominal surgery.[2]

A larger number of patients have "atypical celiac disease," with presentations that are not obviously linked to small intestine malabsorption (e.g., anemia, infertility, osteopenia, and neurologic and psychological manifestations). Even larger figure of patients have "silent celiac disease"; they are essentially asymptomatic despite abnormal small-intestinal histopathology and positive gluten sensitivity serology.

Other symptoms of patients with celiac disease may range from significant malabsorption of multiple nutrients, with diarrhea;weight loss; steatorrhea;and the consequences of nutrient depletion (i.e., metabolic bone disease and anemia), to the total absence of gastrointestinal symptoms despite evidence of the depletion of a singlenutrient (e.g., iron or folate deficiency;edema;osteomalacia from protein loss).[3]

Both IBS and gluten sensitivity are common in the general population and both can coexist with each other independently without necessarily sharing a common pathophysiological basis.[4]

Not all patient with IBS or IBS predominant diarrhea is candidate for screening for gluten sensitivity but testing should be considered in the following situations :

1. Patients with GI symptoms including recurrent or chronic diarrhea;weight loss;malabsorption and abdominalbloating or distension and severe lactose intolerance.
2. Patients with noalternative explanations for extraintestinal manifestations of combined nutritional deficiencies and/or anemia, persistent transaminitis, delayed puberty, short stature, females with recurrent abortions, hypofertility, recurrent aphthous ulcers, dental enamel hypoplasia, idiopathic peripheral neuropathy or cerebellar ataxia, or recurrent atypical migraine.
3. Patients with type 1 diabetes mellitus if they present with clinical manifestations of presumed celiac disease.
4. Asymptomatic first-degree relatives of patients with an established celiac disease.

These recommendations are consistent with the American College of Gastroenterology guidelines.[5]

The Rome III criteria can establish the diagnosis of IBS without further extensive testing and seeking for alternative diagnoses may be considered in cases of nocturnal diarrhea, symptoms unrelated to food or defecation. Alarm features that raise the concern of other diagnosis in presumed IBS cases are weight loss, anemia, bloody stool, positive family history of inflammatory bowel diseases, colonic cancer or celiac disease.

It is very important to remember that patients with celiac disease is at high risk of several malignancies like esophageal and intestinal adenocarcinoma, B- cell MALT lymphoma, hence increased mortality, so strict gluten free diet is essential.[2]

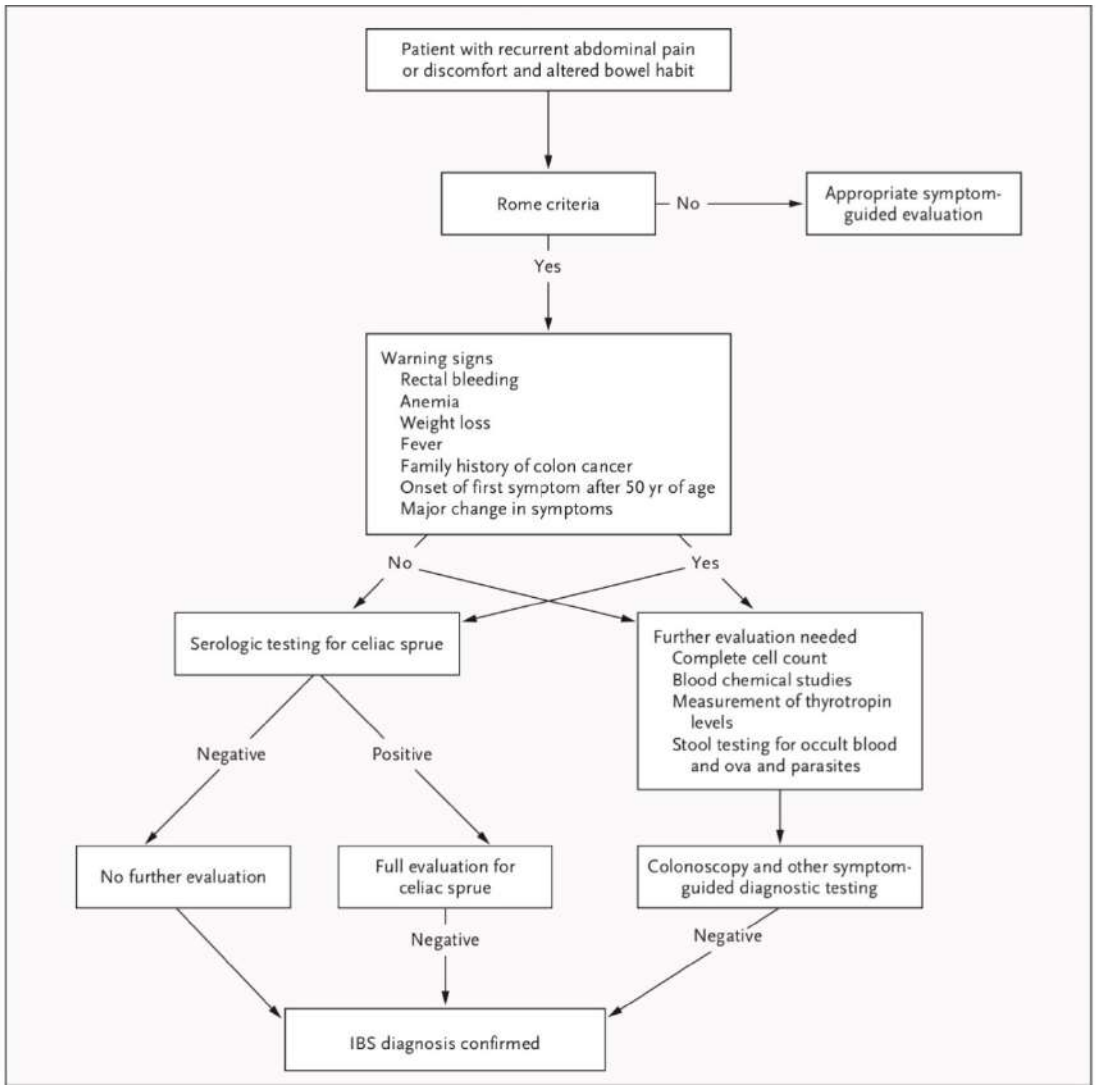

Figure 1 Testing for celiac disease in cases with diagnosed IBS depending on Rome criteria, especially in cases of diarrhea predominant IBD or there is possible alternative diagnosis other than IBS[6]

Diagnosis

Serum Antibody Assays:

1. IgA endomysial antibody (IgA EMA)
2. Immunoglobulins tissue transglutaminase antibody (IgA tTGA and IgG tTGA).
3. Immunoglobulins deamidated gliadin peptide (IgA DGP and IgG DGP)

All patients with Celiac disease express the HLA-DQ2 or HLA-DQ8 allele, although only a minority of people expressing DQ2/DQ8 have celiac disease. Absence of DQ2/DQ8 excludes the diagnosis of celiac disease.

Endoscopic small bowel mucosal biopsy is the gold standard. Endoscopic biopsy is mandatory in suspected cases even if mucosalooks normal. As the histological changes can be patchy, multiple biopsies – usually, more than four biopsies from the second part of the duodenum in addition to one from the duodenal bulb – should be obtained.[7]

Histopathological feature mainly seen are villous atrophy or completely absent with a reduced villous-to-crypt ratio and crypts looks hyperplastic. There is increase in cellularity of the lamina propria with a mainly plasma cells and lymphocytes. The number of intraepithelial lymphocytes per unit length of absorptive epithelium is usually increased.[8]

Modified Marsh Classification of histologic findings in celiac disease (Oberhuber)

Marsh Type	IEL / 100 enterocytes – jejunum	IEL / 100 enterocytes - duodenum	Crypt hyperplasia	Villi
0	<40	<30	Normal	Normal
1	>40	>30	Normal	Normal
2	>40	>30	Increased	Normal
3a	>40	>30	Increased	Mild atrophy
3b	>40	>30	Increased	Marked atrophy
3c	>40	>30	Increased	Complete atrophy

- IEL/100 enterocytes, intraepithelial lymphocytes per 100 enterocytes
- Type 0: Normal; celiac disease highly unlikely.
- Type 1: Seen in patients on gluten free diet (suggesting minimal amounts of gluten or gliadin are being ingested); patients with dermatitis herpetiformis; family members of celiac disease patients, not specific, may be seen in infections.
- Type 2: Very rare, seen occasionally in dermatitis herpetiformis.
- Type 3: Spectrum of changes seen in symptomatic celiac disease.

Patients and Method

A cross sectional study conducted at Alyarmouk teaching hospital internal medicine outpatient clinic from the period of march 2018 to march 2019 involving 140 patients who had been labeled as IBS or presented with recurrent symptoms highly suggestive of IBS.

Inclusion criteria are patients had been previously diagnosed by general practitioner, physician, or gastroenterologist as having irritable bowel syndrome based on symptoms such as recurrent abdominal discomfort, colicky abdominal pain, altered bowel habits, and bloatingat time of presentation.

Exclusion criteria are patients with recent infectious diarrhea, history of inflammatory bowel disease, peptic ulcer disease, gastrointestinal malignancies, previous gastrointestinal surgeries, alcoholism and patients with advanced chronic illnesses (chronic renal failure, long term diabetes mellitus, and congestive heart failure).

The patients had been re-evaluated regarding the diagnosis either due non convincing response to IBS therapy, insufficient initial work up, or new symptoms had been developed.

Screening for gluten sensitivity had been done by using anti tissue transglutaminase (tTGA)assay then the patient with positive results undergone upper endoscopy and histopathological analysis of multiple biopsy specimens from second part of duodenum to confirm the diagnosis.

All the patients who had been diagnosed as Celiac disease undergone complete evaluation for anemia and micronutrient deficiency with CBC, serum ferritin, B12, and vitamin D level.

The patient who had been confirmed to have celiac disease established on gluten free diet and set for follow up.

Statistical Analysis: Analysis of data was carried out by available statistical package (version 25). Statistical significance was considered at (P value ≤ 0.05).

Findings: This study which in cover 140 IBS cases, in which each case had been assessed for possible gluten sensitivity and the results were 17 patients of 140 (12.1%) have positive serology for gluten sensitivity,all the cases with positive serology undergone upper endoscopy which confirm the diagnosis of celiac disease.

Fourteen of 17 patient (82.4%) who were positive were females and 3 (17.6%) were males in which it carry no statistical significance. P =0.585.

Most of these cases were diarrhea predominant IBS 10 of 17 (58.8%) where as 7 (42.2%) were constipation predominant type. Table 1

Table 1: Classification of patients according to age;gender and type variant of IBS in relation with positivity of tTGA

		Anti Tissue Transglutaminase						P value
		Total		Positive		Negative		
		No	%	No	%	No	%	
Age (Years)	<20y	9	6.4	1	5.9	8	6.5	0.405
	20---29	22	15.7	5	29.4	17	13.8	
	30---39	35	25.0	5	29.4	30	24.4	
	40---49	41	29.3	5	29.4	36	29.3	
	50---59	28	20.0	1	5.9	27	22.0	
	=>60y	5	3.6	-	-	5	4.1	
	Mean±SD (Range)	39.2±12.2 (15-79)		33.0±8.9 (19-50)		40.0±12.4 (15-79)		
Gender	Male	32	22.9	3	17.6	29	23.6	0.585
	Female	108	77.1	14	82.4	94	76.4	
Variant of Irritable Bowel	IBS-C	98	70.0	7	41.2	91	74.0	0.006*
	IBS-D	42	30.0	10	58.8	32	26.0	
*Significant difference between proportions using Pearson Chi-square test at 0.05 level.								

IBS-C irritable bowel syndrome – constipation, IBS-D irritable bowel syndrome - diarrhea

All the 17 cases with positive serology were undergone upper endoscopy and biopsy specimen had been obtained from second part of duodenum and sent for histopathological analysis.

The results of histopathological finding were positive for features of Celiac disease and were ranging from (2-3b) modified Marsh Classification of histologic finding in celiac disease (Oberhuber); 8 Patients type 2, 7 Patients type3a, and 2 patients type 3b. Figure 2

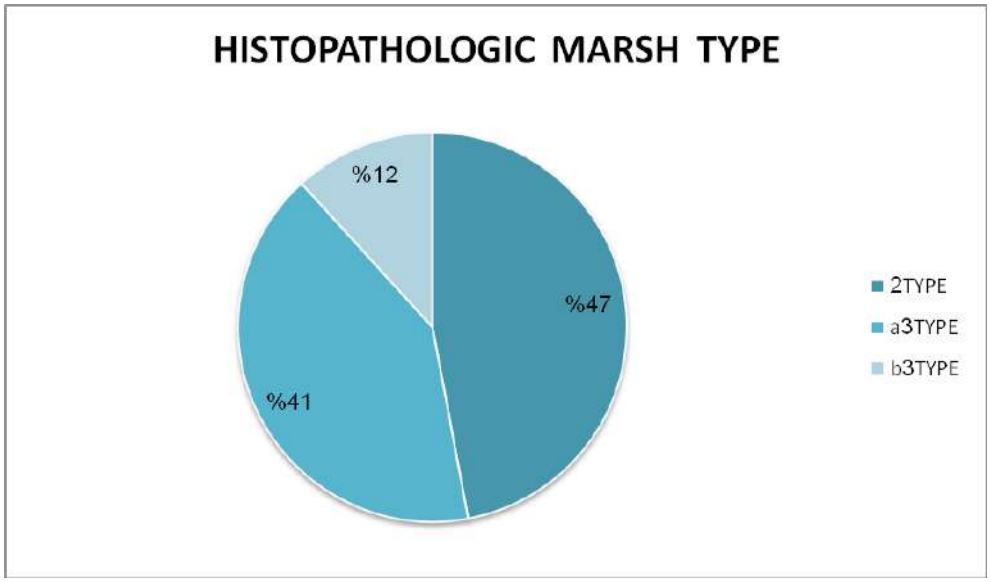

Figure 2: Histopathological finding in patient with positive anti tissue transglutaminase.

Among the total 17 patients, 10 has anemia (7 cases hypochromic microcytic anemia and the rest 3 has normochromic normocytic anemia and no cases of megaloblastic anemia seen despite that there were 3 cases discovered to have B 12 deficiency in which they were had normal hemoglobin and MCV level)Figure 3. All the 7 cases of hypochromic microcytic anemia is confirmed to be iron deficiency anemia as well as 2 cases of normochromic anemia and 3 non anemic patients were had below normal ferritin level; so the total number was 12 of 17 hashad iron deficiency state. Lastly all patients found to have vitamin D level below the reference range. Table 2.

All the cases who had been confirmed to be Celiac disease had been advised for gluten free diet and follow up.

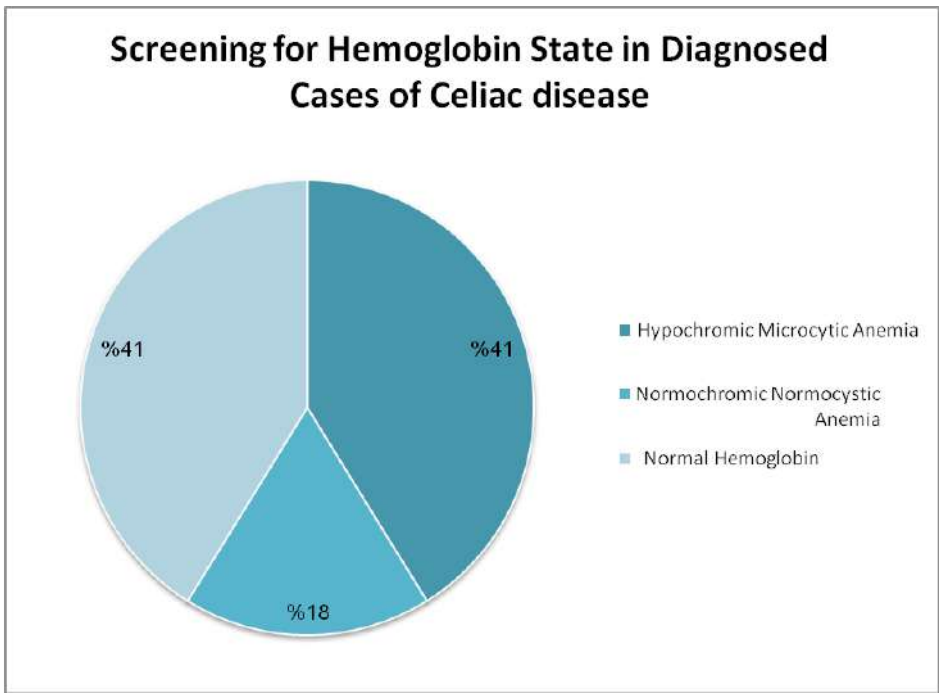

Figure 3: Hemoglobin state in cases of Celiac disease

Table 2: Micronutrient State in cases with Celiac disease

Screening for micronutrient deficiency in Diagnosed cases of Celiac Disease					
Vitamin D3		Vitamin B12		Iron State	
Normal	Deficient	Normal	Deficient	Normal	Deficient
0 (0%)	17 (100%)	14 (82%)	3 (17.6%)	5 (29.4%)	12 (70.5%)

Discussion

Celiac disease is one of the most readily missed illnesses in practice due to the complexity of gastrointestinal symptoms associated with this disease, such as flatulence,diarrhea or rarely constipation, abdominal cramps and fullness which may overlap with other various gastrointestinal illnesses, such as inflammatory bowel diseases, chronic infections and helminth infestation, other food allergies, lactose intolerance, motility disorders and irritable bowel syndrome.

The lack of history or features of micronutrients deficiency, mineral bone diseases and other cutaneous and neurological manifestations of celiac disease does not exclude the presence of this syndrome. So thorough evaluation for gluten sensitivity is essential in presumed cases of IBS which not respond to conventional dietary and medical approaches and carry the same importance of excluding inflammatory bowel disease or other pathologies that may simulate IBS.

Although it has to be pointed that some IBS cases with no evidence of gluten sensitivity may surprisingly get significant benefit in improvement of their symptoms after exclusion of gluten containing food from their diet.

According to this study there is significant number of those patients who had been diagnosed and managed as IBS are actually haveCeliac disease, especially those with diarrhea predominant subtype.

The usual work up of patients who present with symptoms suggestive of IBS does not involve regularly screening for gluten sensitivity or any form of food allergies unless the patient has features of malabsorption ofmicronutrients, diarrhea, steatorrhea, weight loss or coexistence of dermatitis herpetiformis.

Still early diagnosis of Celiac disease and establishment of gluten free diet is essential to prevent long term serious complications other than vitamin and minerals malabsorption such us ulcerative jejuno-ileitis, small intestinal lymphoma and small bowel adenocarcinoma.[9]

As compared with the study*The prevalence of celiac disease in patients with irritable bowel syndrome and its subtypes* byDanuta Domżał-Magrowskawho had been published in Przegląd Gastroenterologiczny 2016 in which concomitant positive result of genetic testing and any elevated serum antibodies specific to celiac disease was found in 12.5% of IBS patients.[10]

So this study carry a highly comparable results, Screening for anemia and micronutrient deficiency in the cases who had been confirmed to have Celiac disease reveals that anemia is present in 10 of 17 cases (58.8%) that was mainly of iron deficiency which is the most common type of nutritional anemia in Celiac disease, there is also significant number of cases with iron deficiency state to be added to cases of IDA to be a total of 12 of 17 (70.1%).

Mainly because of small size of sample there is no case with megaloblastic anemia detected but still there are 3 cases with low serum B12 level. It is also important to be referred that there is no data available about folate statues in our study because lack of availability of reliable test for red blood cell folate in our facility at time of the study and the level of serum folate does not reflect the actual folate level state.

Vitamin D deficiency is present in all cases who had been diagnosed as Celiac disease but it may reflect the high prevalence of vitamin D deficiency among Iraqi patients in general as well as the effect of Celiac disease on lipid soluble vitamins absorption.

Finally it is important to follow up all the patients who had been diagnosed as celiac disease regarding improvement in their GI symptoms following exclusion of gluten from their diet, if not, the coexistence of IBS or other GI pathologies still possible and careful clinical re-evaluation is warranted.

Conclusions

There is significant number of celiac disease patient had been diagnosed and managed as IBS cases (mainly diarrhea predominant type) and there may be coexistence of both illnesses in the same patient.

Ethical Clearance: No

Source of Findings: Self

Conflict of Interest: Nil

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Incidence of Caesarian Section (C/S) in AL- Fallujah Teaching Hospital

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Abstract

Background: In Iraq as in most Arab countries and others in world, increased the rate of Cesarean section from year to year therefor the objective Study determine the incidence of caesarians action during 6 month in Fallujah teaching hospital.

Patients and Method: A prospective analysis of 540 cases of caesarian action done from September 2018 to February 2019, in Department of Gynecology and obstetric Al Fallujah teaching hospital. data collected from hospital record their personal data,type of c/s,indication of c/s.

Results: There were 540 cases c/s done 69 is emergency and 471 is elective. Most of them 466 at age between(26-35) years and about 349 indicated to c/s due to previous c/s.

Conclusion: c/s are commonly performed operation for women and its associated with increase in maternal and infant morbidity particularly after emergency c/s .the overall rate of c/s is high and most frequent reason for c/s is scarred uterus.

Keywords: *Incidence; Caesarian section (C/S); AL- Fallujah Teaching hospital.*

Introduction

Over several decades, has come to a dramatic increase in the number of Caesarean sections performed across the world, especially in developed countrie[(1)]. The Labour is the physiological process that results in birth of ababy, delivery of the placenta and the signal for lactation to begin[(2)].

An understanding of the physiological and anatomical principles involved in normal and abnormal labour is best summarized using the '3 Ps', which are the powers, the passages and the passenger. The 'powers' refers to forces, firstly the contractions of the uterine muscle that result in passage of the fetus through the birth canal, and secondly the maternal effort of pushing in the second stage of labour.

The 'passages' refers to the birth canal itself, which is made up of the bony pelvis, the muscles of the pelvic floor and the soft tissues of the perineum.'passenger' refers to the fetus in terms of its size (small, average, large) presentation (that part of the fetus entering the pelvis first, e.g. vertex of head,face, brow or breech) and position (orientation of the presenting part in relation to the maternal public symphysis, e.g. occipito-anterior, occipito-posterior). When the 3Ps are favourable, normal labour is likely to ensue, resulting in an unassisted or spontaneous vaginal birth[(3).]

When any of the 3Ps are unfavourable, labour is likely to be abnormal,resulting in the need for intervention and with that, an increased risk of morbidity or mortality. A caesarean section is a surgical procedure in which incisions are made through a woman's abdomen

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(laparotomy) and uterus (hysterotomy) to deliver one or morebabies[4].

Increased range of Cesarean delivery (CD) delivery rate were reported across the world. CSdelivery rate (20%) in the United Kingdom and (22.5%) in Canada. Whilst more than 85% in both South America and Italy[5].

Rates have risen in the United States in a dramatic fashion from less than 5% in the 1960s to 32.7% by 2013, with stable rates around 32% to 33% in the past 5 years(2), Among the reasons for this increase are (1) a continued increase in primary CDs for dystocia, failed induction, and malpresentation; (2) an increase in the proportion of women with obesity, diabetes mellitus, and multiple gestation, which predispose to CD; (3) limited use of a trial of labor after cesarean (TOLAC) delivery[6].

The WHO has proposed an incidence of CD between 10% and 15% as a target to optimize maternal and perinatal health[7].Instead of setting goals or limits for overall CD rates, it is most important to monitor maternal and perinatal health outcomes(2).so in iraq overall rate of cesarean sections increased from 18.0% in 2008 to 24.4% in 2012 [8].

Caesarian section also causes psychosocial complications as a longer stay in hospital on that occasion the woman is separated from family and other children, separation from the newborn, then she has a sense of "being sick", which also affects the lack of desire for breastfeeding the baby[9]

Traditionally, caesarean sections have been classified as elective or emergency, Elective caesarean sections are usually booked days or weeks ahead of time and are conducted during daytime hours, All other caesarean sections can be classified as emergency, irrespective of whether the woman was in labour or not. so the classification system for emergency caesarean section as category 1: Immediate threat to life of woman or fetus; category 2: No immediate threat to life of woman or fetus; category 3: Requires early delivery and category 4: At a time to suit the woman and maternity services(1).Aim of study to determine the incidence of c/s during 6 month, type of c/s and indication of c/s in Gynecology and obstetric department of Al-Fallujah teaching hospital. This study will help to determine why the incidence increase and to research about the effect of c/s in subsequent pregnancy

Patients and Method

We prospectively analyzed by cohort study a total 540 women who underwent c/s between september2018 and february 2019 at AL-Fallujah teaching hospital, department of gynecology and obstetrics .the data was collected from patient and from hospital record.

The medical record sheets of all identified women were reviewed regarding age, parity, type of c/s, indication of c/s(failed labor, previous c/s, pregnancy induced hypertention, gestation DM, multiple gestation, cord prolapse, premature rupture of membrane, intrauterine pathology, oligohydramnios, placenta Previa, maternal request, malpresentation, fetal distress.

Finding: The most common indication in this study is previous c/s about 64.60% while the incidence of other indication show in the table 1 .

Table 1: Indication of caesarian section in our study

Parameters	N	%
Maternal request	23	4.20
Premature rupture of membrane	4	0.74
Cord prolapse	0	0.00
Intrauterine pathology	2	0.37
Multiple gestation	6	1.11
oligohydramnious	15	2.80
Placenta previa	2	0.37
malpresentation	47	8.70
Gestation DM	1	0.18
Pregnancy induced hypertension	48	8.90
Previous C/S	349	64.60
Fetal distress	43	8.00

The percentage according to type of C/S was emergency in 12.8% patient & 87.2 % was electively see table 2.

Table 2: Type of C/S.

Type	N	%
Emergency	69	12.8
Elective	471	87.2
Total	**540**	

The percentage according to age group were 37.8% patient below 25years old, 49,2 % from patient were from 26-35 years old and 13% patients more than 35 years see table 3.

Table 3: Age distribution of patients.

Age (Years)	No.	%
15-25	204	37.8
26-35	266	49.2
>35	70	13
Total	**540**	**100**

Discussion

Increase rates of c/s delivery in women has been a public health concern now a days .in the past the rate is lower and usually performed for fetal reasons but nowadays mainly for maternal reasons. In this study elective c/s 87.2% and most of them due to previous c/s in 67% of patients, while the emergency about 12.8%.

We notice that there is increase in percentage of caesarian section in our hospital which is mainly due to repeated scar. The incidence of caesarean section varies between(10- 25) % in most developed countries, caesarean section[10].

Our study also limited by a 6 month period and just in governmental hospital therefore future research needs to consider private hospitals. This high rate of c/s is higher than the recommendation of WHO health expert who considered the ideal rate for c/s to be between 10% and 15%[7].

Current study show that age between 15-25 years have high incidence, The results of the current study were consistent with Diana et al., study, which showed that(85, 91)% of the women were in the age18-30 years whilst (15, 9) % were in (31-40) years in the elective and emergency caesarean sections respectively[11].

The percentage of elective caesarean (87.2%)were more than emergency caesarean section (12.8%), these results of the current study fully consistent with the findings of Diana & Tipandjan where the results showed that significantly higher among those who had elective caesarean than those had emergency caesarean section in the present delivery because decision to have elective caesarean mainly depends on women who had one or more previous caesarean sections prior to the present delivery[11].

Conclusion

- In current study about The most common indication in this study is previous c/s about 64.60% .
- 87.2% of cases is elective and 12.8% is emergency. And about 49.2% of them at age between(26-35) years, so 37.8% at age(15-25) years and 13% at age >30 years .
- Caesarian section are commonly performed operation for women and its associated with increase in maternal and infant morbidity particularly after emergency c/s .
- The overall rate of c/s is high and most frequent reason for c/s is scarred uterus .

Recommendation

- Future research is needed to explore the non clinical causes of c/s like attitudes, behaviors, skill of obstetricians as well as the social, economic and legal environment in the country.
- To maintain an acceptable caesarian section rate a multidisciplinary quality assurance program should be established in all facilities in which delivery occurs.

Conflict of Interest: Non

Source of Findings: Self

Ethical Clearance: This research was carried out with the patient's verbal and hospital approval before the cases was taken.

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Relation of Anti FSH Antibodies and Polycystic Ovarian Syndrome in Women

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Abstract

The aim of the study was to detect the level of anti-follicle stimulating hormone antibody in polycystic women and compared to normal control group. A cross-sectional study was carried out in Erbil city from January 15th of October 2018, to 15th of March 2019. The number of polycystic ovary syndrome (PCOS) women under study was 60 women whose ages were between 15 and 45 years old. These patients admitted to Gynecology and Obstetrics Teaching Hospital. The control group who were matched to the patients studied included 30 individuals. The study showed that there is the significant difference between PCOS women and the control group concerning Anti FSH Antibodies level and the highest mean of Anti FSH Ab level occurred in PCOS women (1.61± 0.14 vs. 0.92 ± 0.04). There was a non-significant relation between each one of LH, FSH, LH/FSH ratio with Anti FSH Ab, in this study. The highest rate of PCOS women had irregular menstrual cycle. The study showed that most PCOS women included in the study had hirsutism. The rate of acne recorded among PCOS women in the study was 48.4 while 51.6 without acne. Conclusion: It was concluded that there was a highly statistically significant relation of Anti FSH Ab with PCOS.

Keywords: *Anti FSH Antibodies; Polycystic Ovarian Syndrome (PCOS); LH;FSH; LH/FSH ratio.*

Introduction

Polycystic ovarian syndrome (PCOS) is a common endocrine disorder and abnormality in the ovaries at reproductive ages and caused by the imbalance of female sex hormones(1). Levels of the sex hormones progesterone and estrogen are out of balance in the condition of PCOS, this can cause problems with women's menstrual cycle(2). With a prevalence rate of approximately 5% - 10% among women of reproductive age(3). Pathophysiology of polycystic ovary syndrome appears to be multifactorial and polygenic, key features include menstrual cycle disturbance, hyperandrogenism, and obesityand increased risk for type 2 diabetes(4). A polycystic ovarian syndrome is diagnosed by the appearance of at least two of the following criteria: increased androgenic hormones, irregular or absent ovulation(5). With 12 follicles at least from 2 to 9mm per ovary and/or ovarian volume at least 10 ml(6).

The human ovary can be the target of an autoimmune attack in different circumstances, including many organ-specific or systemic autoimmune diseases, the presence of a specific antibody is a commonly accepted sign of autoimmune disease and works to distinguish between autoimmune and autoimmune conditions, for both clinical practice and other research studies, other diseases regarding ovaries, such as unexplained infertility, PCOS and endometriosis have been associated with anti-ovarian autoimmunity(7). Several types of research suggested the relationship between PCOS and autoimmunity with controversial results, which showed that serologic signs of autoimmunity elevated in patients with PCOS(8).

With the confirmation of the autoimmune of the ovary, the anti-FSH body may interfere with the internal or external function of FSH; anti- FSH antibody may interact with FSH and form immune complexes so provoke its clearance, maybe FSH antibodies can interfere with the FSH link to its receptors(9). FSH's specific beta-epitope antibodies were found to be more prevalent in endometriosis and polycystic ovary syndrome (PCOS)(10).

Methodology

A cross-sectional study was carried out in Erbil city from January 15th of October 2018 to 15th of March 2019. The number of PCOS women under study were 60 women whose ages were between 18 and 45 years. Diagnosis of PCOS was based on the presence of two of following Rotterdam criteria: oligo and/or anovulation, clinical and/or biochemical signs of hyperandrogenism, and polycystic ovaries on ultrasound, meaning presence of 12 or more follicles measuring 2–9 mm in diameter in each ovary and/or ovarian volume more than 10 cm3. Besides, the control group consisted of 30 healthy volunteer women aged between 18 and 45 years with regular menstrual cycles. A 5 ml volume of the blood sample was taken by vein puncture from each subject enrolled in this study. Blood samples were placed into sterile test tubes after blood clotting, centrifuged at 3000 rpm for 15 minutes then clot removed and remain re-centrifuged at 3000 for 10 minute and the resulting serum was inhaled using mechanical micropipette and transported into clean test tubes and stored in Deep freeze at-20 °c until time of analysis.

Statistical Analysis: Computerized statistically analysis was performed using GraphPab Prism6 statistic program version 6.01. Comparison was carried out using; T-Test probability (P-value)

Finding: The study showed that the highest rate of PCOS women had an irregular menstrual cycle 76.6% and 23.4% of them had a normal menstrual cycle, Moreover, the highest rate of hirsutisms among PCOS women recorded was 75% while only 25% were without hirsutisms, Including Acne was observed the highest rate of PCOS women has 48.4% while 51.6 were without any acne, Finally the alopecia in PCOS women had the highest rate was 20% while 80% of them without alopecia. Table 1

Table 1: Clinical data in PCOS women.

Parameters		No.	%
Age	<30 year	33	55
	>30 year	27	45
BMI (kg/m²)	<30	23	38.4
	>30	37	61.6
Hirsutism	Yes	45	75
	No	15	25
Acne	Yes	29	48.4
	No	31	51.6
Menstrual cycle disturbance	Regular	14	23.4
	Irregular	46	76.6
Alopecia	Yes	12	20
	No	48	80

The study showed that there is the significant difference between PCOS women and the control group concerning Anti FSH Antibody level and the highest mean of Anti FSH Ab occurred in PCOS women (1.61± 0.14 vs. 0.92 ± 0.04), Table 2.

Table 2:Relation of Anti FSH Antibody level with PCOS.

All groups	Anti-FSH Ab test			Mean	SD
		No.	%		
PCOS group	Positive	13	21.6	1.61	0.14
	Negative	47	78.4		
	Total	60	100		
Control group	Positive	0	0	0.92	0.04
	Negative	30	100		
	Total	30	100		

P. value: <0.05 (HS); HS: Highly significant, PCOS: Polycystic ovary syndrome; SD: Standard deviation

The study showed there was a nonsignificant relation between FSH and Anti FSH Ab level among PCOS women in this study. Although there was nonsignificant relation, while there were decreased rates of results related to FSH among PCOS women. Table 3

Table 3: Relation of Anti FSH Antibody with FSH in PCOS women.

Relation of Anti FSH Ab with FSH in PCOS				
FSH	PCOS with Anti FSH Ab Positive		PCOS with Anti FSH Ab Negative	
	No.	%	No.	%
Normal	4	30.8	18	38.3
Increased	0	0	0	0
Decreased	9	69.2	29	61.7
Total	13	100	47	100
P-Value>0.05 NS				

The study showed there was a nonsignificant relation between LH and Anti FSH Ab level among PCOS women enrolled in this study. Although there was nonsignificant relation, while there were increased rates of results related to LH among PCOS women. Table 4.

Table 4:Relation of Anti FSH Antibodywith LH in PCOS women.

Relation of Anti FSH Ab with LH in PCOS				
LH	**Anti FSH Ab Positive**		**Anti FSH Ab Negative**	
	No.	**%**	**No.**	**%**
Normal	2	84.6	10	21.3
Increased	11	15.4	37	78.7
Decreased	0	0	0	0
Total	**13**	**100**	**47**	**100**
P-Value>0.05 NS				

The study showed there was a nonsignificant relation between LH/FSH ratio and Anti FSH Ab level among PCOS women in this study. Although there was nonsignificant relation, while there were increased rates of results related to the LH/FSH ratio among PCOS women. Table 5

Table 5: Relation of Anti FSH Antibodywith LH/ FSH ratio in PCOS women.

Relation of Anti FSH Ab with LH/FSH ratio in PCOS				
LH/FSH	**Anti FSH Ab Positive**		**Anti FSH Ab Negative**	
	No.	**%**	**No.**	**%**
Normal	5	38.5	20	42.6
Increased	8	61.5	27	57.4
Decreased	0	0	0	0
Total	**13**	**100**	**47**	**100**
P-Value>0.05 NS				

Discussion

PCOS is an endocrine disorder with multifactor etiology and different clinical manifestations. This is the most common cause of menstrual disturbance and ovulatory infertility in women[11].

Hirsutism is the most common clinical manifestation of hyperandrogenism or the presence of excess terminal hairs in a male-like pattern, excessive hair growth can often cause significant psychological and emotional distress[12]. Like that on the face, chest, written alba, lower back, buttocks and front thighs. Hirsutism is caused by androgen effects on the lipid unit and is usually associated with acne and oily skin. This is usually due to increased androgen production from the ovaries or adrenal glands[13]. High concentrations of testosterone, one of the factors contributing to the emergence of some symptoms of PCOS such as infertility, PCOS, hirsutism, and acne[14]. The results noticed were in agreement with *et al*[15].And *et al*[16].

Concluded the source of hyperandrogenism due to the genetic abnormalities in insulin receptor resulting in the thickening of the ovarian theca that increased the androgen production and inhibition of SHBG synthesis. The degree of hirsutism might be influenced by the relative activity of the 5α reductase that converts testosterone to the more active metabolic dihydrotestosterone[17-19]. But menstrual cycle irregularity is a relatively accurate surrogate of ovulation and is easily obtained from medical history[20]. Therefore, menstrual cycle pattern might serve as a marker of IR in patients with PCOS, as IR can induce oligo- or anovulation and thus menstrual cycle irregularity by exacerbating hyperandrogenemia and by disrupting follicular growth[21]. Nevertheless, very few small studies evaluated the association between menstruation abnormalities and the endocrine and metabolic characteristics in PCOS[22].

Gowri *et al*[23] showed that the acne was seen in highest percentage (67.5%), followed by hirsutism (62.5%) and fasting insulin levels was the most common hormonal abnormality seen in both acne and hirsutism. Sharma *et al*[24]Majumdar *et al*[25]also showed that acne was the most common cutaneous manifestation in PCOS group. The pathophysiology of PCOS appears to be multifactorial and polygenic. The main pathophysiology points to the ovary being the source of excess androgens, which appears to result from an abnormal regulation of steroidogenesis[26]. The excessive secretion of androgens in PCOS patients results in a series of skin changes including hirsutism, acne, seborrhea and androgenetic alopecia[27].

In agreement with our findings, Hussein *et al* [28] found that FSH Ab were elevated in PCOS women, there is increasing in the anti-FSH antibody level in PCOS women as compared to healthy women was agreed with the study done in Basrah[29]. Similarly,Haller-Kikkatalo *et al*[30].Found the anti-FSH Ab of is statistically higher in infertile PCOS than in control group and also detected anti-FSH antibodies in healthy non-pregnant women but at lower rates than for patients with endometriosis or PCOS.

An autoimmune mechanism has also been suggested in some cases of PCOS, where increased prevalence of antiovarian antibodies and common organ- and nonorgan specific autoantibodies has been detected[31, 32]. To explain the presence of such spontaneous antibodies, it was supposed that an alteration of the immune system might be necessary and that the antigen responsible for

their production could be either the circulating FSH from the female organism or the FSH in seminal fluid that may upregulate the anti-FSH immune response in females[30]. Thus, anti-FSH antibodies might have an inhibitory effect on FSH by preventing the binding of the hormone to its receptor or by trapping FSH in immune complexes[32, 33].

There are many hypotheses concerning the causes of PCOS development and the concurrent coexistence of many interdependent disorders is also possible. Most attention is paid to the hypersecretion of LH and insulin resistance as well as hyperinsulinemia.In agreement with our findings,Tracy WillIams*et al*[34] founded revealed the elevation of LH and reduction of FSH in PCOS women with elevation in of LH/FSH ratiowhen compared with healthy .Some studies assess the incidence of elevated LH/FSH ratio in PCOS women reached 94%[25]

This is maybe part of an autoimmune process that is not specified in this case, and the ovary is targeted by the body's immune system leading to a pathological condition known as "ovarian autoimmune" in most autoimmune diseases of endocrine glands, an abnormal level in hormone regulatory system is the primary diagnostic indicator for potential diseases, the diagnosis is confirmed by the measurement of specific antibodies. Regardless of the mechanisms involved in autoimmune diseases[7].To explain why some infertile patients develop anti-gonadotropin antibodies, some studies focused on the Major Histocompatibility Complex (MHC) Class II[10]. The role of the MHC Class II is to present exogenous proteins to immune cells, which leads to a humoral immune response. Finally, no more research has been found in this regard and this proves that this subject needs to be studied and more research to reach sufficient results.

Conflict of Interest: None.

Source of Funding: Self .

Ethical Clearance: None .

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Serum Ferritin Levels with Some Hematological Parameters in Women with Preterm Labour or PPROM

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Abstract

Preterm labour is defined as the presence of uterine contractions of sufficient frequency and intensity to cause progressive effacement and dilation of the cervix prior to term gestation between (24- 37) weeks of gestation**.**Aim of current study aims at conducting and detecting the serum ferritin level could be use as predictor in women with preterm labour. So to decrease morbidity and mortality among the mother and her baby by predicting early labour .Patient and Method:The study was conducted at the Department of Obstetrics and Gynecology at Tikrit Teaching Hospital,included 100(study and control)laboring women attending to hospital, patients included in the study were subdivided into two groups:fifty of them were preterm labour cases(gestational age between 24-37) and 50 of them had intact membranes and the other 50 were with preterm premature rupture of membranes.the second group consist of 100 patients with gestational age more than 37 weeks.all patient were subjected to the Hematological investigations(HB%,PCV,and serum ferritin). Results:In this study the patients were of comparable age with a mean age of the preterm labour group of 23.45+4.18 ranging from16-35 years, so gestational age distribution of both group, the preterm group women had a mean gestational age (34 weeks) which is significantly lower than those of the term pregnant women (38 weeks).All groups were comparable in terms of hemoglobin and PCV level ($p>0.05$), while there was higher serum iron and higher serum ferritin level in the preterm group compared to the control group ($p<0.0001$).only serum ferritin was higher in those PPROM($P<0.0001$)while the other parameter were not significantly different in there level between the two groups.Preterm group **showed** significant higher of serum iron of preterm from control ($P<0.0001$)and preterm premature ruptured membranes PPROM from control ($P<0.0001$).The serum ferritin showed a significantly higher level in preterm labour from control ($P<0.0001$) and significantly higher level in preterm premature ruptured membranes PPROM than control group ($P<0.0001$).**Conclusion** Elevated serum ferritin level could be use as a predictor for prediction of spontaneous preterm delivery and PPROM at high risk of these complication, although it is worth mentioning that a larger study population .

Keywords: *Serum ferritin; hematological parameters; women with preterm labour;PPROM.*

Introduction

For reasons related to etiology, out come and recurrence risk, preterm labour should be divided into three gestational groups**:** mildly preterm at 32^{+0} to 36^{+6} weeks (incidence 5.5%), **moderately** preterm 28^{+0} to 32^{+6} weeks (incidence 0.7%) and **extremely** preterm birth at 24^{+0} to 27^{+6} weeks (incidence 0.4%) **[1,2,3].**

The incidence of preterm labour in developed world between 7 to 12%**[1].** There has been a small gradual rise in the incidence of preterm labour associated with assisted reproduction and an increased tendency to obstetric intervention. The rate of preterm labour prior to 32 weeks has remained relatively stable at 1-2%. About one quarter of preterm labour is elective deliveries, usually for pre-eclampsia, intrauterine growth restriction, or maternal disease. The remainder is due to preterm labour and delivery. The incidence is at

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its lowest in women in their 20s.The risk is increased in teenagers and in women in their 30s [1, 3].

There are relatively frequent causes of preterm labour approximately 5-10% of patients with preterm labour have infection outside the uterus; most common is urinary tract infection [4].Romero and Mazor has presented the evidence suggesting that extra uterine infection may cause preterm labour by mechanism involving productionof IL and TNF by maternal macrophage which in turn will trigger the production of PG by amnion [4].

Early differentiation between true & false labor is difficult before there is demonstrable cervical effacement & dilatation .Painful or painless uterine contractions, symptoms such as pelvic pressure, menstrual-like cramps, watery vaginal discharge & lower back pain have been empirically associated with impending PTL[5].

Women at high risk of preterm labour will initially be detected based on past obstetrical history[6]Ferritin is a large protein shell(Molecular weight 450,000) comprised of 24 subunits,covering an iron core containing up to 4000 atomsof iron [7] ferritin occurs in virtually all cell of body and also in tissue fluids,it mainly located in the spleen, liver, and bone marrow,it is also found in the mucosal cell of the small intestine, placenta,kidney,testes,skeletal muscles and circulating plasma[8,9]

Ferritin act as the soluble storage form of iron in tissue (hemosiderin is relatively insoluble).It may serve other functions as well although these are controversial. It is found in most cells of the body, especially macrophages, hepatocytes, erythrocytes. Synthesis occurs in the liver and the rate correlates directly with the cellular iron content. Control of ferritin synthesis occur post-transcriptionally (at the mRNA level).There are iron-and cytokine-responsiv elements in ferritin mRNA. Increased iron or cytokine (suchIL-1, IL-6) promotes ferritin translation resulting in increased iron storage. This is one of the causes of iron sequestration that occurs in animals with chronic or inflammatory disease and will reduce serum iron value. The function is not known,but the concentration correlate well with the amount of stored iron in normal(and most diseased) subjects. It has been proposed that extra cellular ferritin has an important role in host defense against bacteremia by stimulating oxidative metabolism[6,10], in women receiving routine prenatal care,low serum ferritin level is indicated of low iron store,but high serum, ferritin concentration appear to represent an acut-phase reaction and predict preterm delivery[11].In pregnancy, serum ferritin concentration is maximum at 12-16 weeks gestation, and then falls with advancing gestation to reach a nadir at the third trimester[6]

Because of previously reported very strong association between preterm birth and intrauterine infection, and because other inflammatory conditions have been associated with elevated ferritin level, it was hypothesized that sub clinical maternal infection was responsible for both elevated ferritin level and for the spontaneous preterm birth[12,13].Serum ferritin could be useful to identify preterm labour in pregnancy.to account for the association between elevated serum ferritin concentration and spontaneous preterm delivery we suggest that the production of ferritin or the release of ferritin from tissue may be of an acute phase reactant associated with an upper genital tract infection. Themechanism of such association may be secondary to the increased production of ferritin by macrophages that infiltrate in to the choriondecidual interface after bacterial colonization[12,14]

Aim of current study aims at conducting and detecting the serum ferritin level could be use as predictor in women with preterm labour. So to decrease morbidity and mortality among the mother and her baby by predicting early labour by The current study was done aiming to measure the serum ferritin level with some other hematological parameters in women with preterm labour or PPROM and compare them to that of control group composed of term pregnant women in order .

Patient and Method

The study was conducted at the Department of Obstetrics and Gynecology at Tikrit Teaching **Hospital,**included 100(study and control)laboring women attending to hospital and fulfilling the following criteria(Cervical dilatation >3cm; Fully effaced cervix; Uterin contraction 3/10m), While laboring women with the following criteria were excluded(Anemia (hemoglobin<10.5g/dl); diabetes mellitus; Pr e-eclampsia, eclampsia; Polyhydramnios; Iron overload stats;Liver disease; Renal disease;Chronic infectious diseases;Smoker;Fetal congenital anomalies; Blood transfusion; Drugs, iron, thyroid drug; Haematological disorder;Multiple pregnancy.

The patients included in the study were subdivided into two groups:

1. fifty of them were preterm labour cases(gestational age between 24-37) and 50 of them had intact membranes and the other 50 were with preterm premature rupture of membranes.Gestational age was calculated by combined information from last menstrual period and first trimester ultrasound.
2. The second group consist of 100 patients with gestational age more than 37 weeks.All patient were subjected to the following:
   a. Hematological investigations(HB%,PCV,and serum ferritin)

b. Abdominal ultrasound to check for gestational age,and also to exclude congenital anomalies.

c. Serum ferritin was assayed by UBI Mgiwelltm Ferritin quantitative test system.

Estimation of serum ferritin: The serum ferritin (SF)was assayed by UBI Magiwelltm Ferritin quantitative test system. This is a solid phase enzyme-linked immunosorbent assay (ELISA).Using the mean absorbance value for sample, determine the corresponding concentration of ferritin in ng/ml for the standard curve.

Expected value and sensitivity of ferritin for female 10-12ng/ml, Hb and packet cell volume were estimated by automated coulter.Serum iron was estimated by standard method recommended by the international committee for standardization Hematology. The concentration (X) of each reference was plotted against its absorbance(y) on a full logarithmic graph paper and a standard curve was drawn. Ferritin values of samples were obtained by reference to the standard curve following the obtaining of the **equation** between (x) and (y). Obtained from the standard curve. (Figure 1).

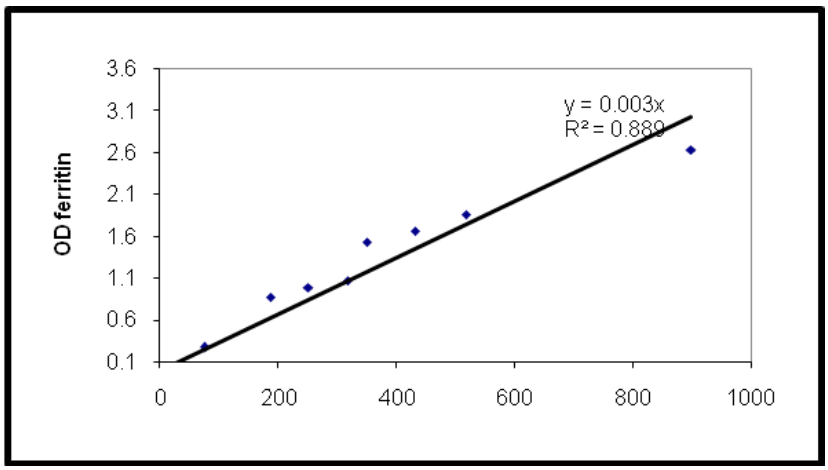

Figure 1: The standard curve for ferritin concentration.

Statistical Analysis: Statistical analysis was performed using (Statistical Packages for Social Sciences version 15) analysis software.

Finding: In this study the patients were of comparable age with a mean age of the preterm labour group of 23.45+4.18 ranging from 16-35 years, While the mean age of control group was 24.75+4.18 ranging from 15-35 years as show in Table 1.

Table 1:The Maternal Age (years) Distribution in the Studied Groups

Age (Years)	Preterm Labour No	Preterm Labour %	Control No	Control %
15-19	18	18.0	12	12.0
20-24	47	47.0	33	33.0
25-29	28	28.0	44	44.0
30-34	4	4.0	7	7.0
35	3	3.0	4	4.0
Mean+SD (min-max)	23.45±4.14 (16-35)		24.75±4.18 (15-35)	

P=0.086 (Not significant using Pearson chi-squared test at level of significance)

Table 2 showed the gestational age distribution of both group, the preterm group women had a mean gestational age (34 weeks) which is significantly lower than those of the term pregnant women (38 weeks).

Table 2: The Gestational Gge (weeks) Distribution in the Studied Groups.

Gestational age (weeks)	Preterm Labour No	Preterm Labour %	Control N0	Control %
24-29	9	9.0	-	-
30-31	6	6.0	-	-
32-33	4	4.0	-	-
34-35	64	64.0	-	-
37	17	17.0	34	34.0
38-39	-	-	42	42.0
40-42	-	-	24	24.0
Mean± SD	34.02±2.23 (28-36)	34.02±2.23 (28-36)	38.46±1.6 (37-42)	38.46±1.6 (37-42)

P=0.0001(Significant using Pearson chi-squared test at 0.05 level of significance)

All groups were comparable in terms of hemoglobin and PCV level (p>0.05) as it is shown in table 3, while there was higher serum iron and higher serum ferritin level in the preterm group compared to the control group (p<0.0001).

Table 3: The Hemoglobin, PCV, Serum Iron and Serum Ferritin Levels in the Studied Groups

	Pre-term labour men±SD	Control	Pvalue
Hb(g/dl)	11.80±0.76 (11.00-13.40)	11.88±0.74 (11.00-13.30)	0.445
PCV%	0.36±0.03 (0.30-0.40)	0.37±0.02 (0.33-0.40)	0.355
Iron(Mg/dl)	23.45±9.38 9.87-48.70	19.44±4.83 (12.40-30.20)	0.0001*
Ferritin(ng/ml)	25.81±7.69 (0.50-40.00)	9.24±5.50 (0-19.50)	0.0001*

Data were presented as Mean± SD(Range)

Regarding the comparison of the preterm labour with intact membrane groups with the (PPROM)group, as it is shown in table 4.only serum ferritin was higher in those PPROM(P<0.0001)while the other parameter were not significantly different in there level between the two groups.

Table 4:The hemoglobin, PCV, serum iron, and serum ferritin level in the studied groups.

	Preterm labour	Preterm PROM labour	P value
Hb(g/dl)	11.79±0.82 (11.0-13.40)	11.8±0.70 (11.0-13.00)	0.927
PCV%	0.36±0.03 (0.30-0.40)	0.36±0.02 (0.30-0.40)	-
Iron(Mg/dl)	21.79±5.75 (16.70-48.70)	25.12±11.80 (9.87-48.50)	0.076
Ferritin(ng/ml)	19.98±5.62 (0.5-26.00)	31.64±4.31 (25.50-40.00)	0.0001*

Data were presented as Mean± SD(Range), *highly Significant using t-test for two independent means at 0.05 level of significant.

Table (5): The hemoglobin, PCV, serum iron, and serum ferritin levels in the studied groups.

	Preterm Labour	PPROM	Control	P value for preterm x control	P value for PPROM xcontrol
Hb (gl/dl)	11.79±0.82	11.80±0.70	11.88±0.74	0.509	0.558
PCV%	0.36±0.03	0.36±0.02	0.37±0.02	0.449	0.424
Iron(mg/dl)	21.79±5.75	25.12±11.8	19.44±4.83	0.009*	0.0001*
Ferritin (ng/ml)	19.89±5.62	31.46±4.31	9.24±5.50	0.0001*	0.0001*

*highly significant using t-test for two independent means at 0.05 level of significance.

Table 5 showed the comparison between preterm labour and preterm premature rupture of membranes PPROM with that of control term pregnant women regarding different hematological parameters .Preterm group showed significant higher of serum iron of preterm from control (P<0.0001)and preterm premature ruptured membranes PPROM from control (P<0.0001). The serum ferritin showed a significantly higher level in preterm labour from control (P<0.0001) and significantly higher level in preterm premature ruptured membranes PPROM than control group (P<0.0001).These findings were demonstrated graphically for serum ironand serum ferritin levels.

Discussion

The prediction of which pregnancies will end in preterm birth is a reasonable goal for several reasons. First, predicting which women might have a preterm delivery may allow us to initiate appropriate risk – specific treatment. Second, it may help us to define a population of women who are at risk so that we can study a particular treatment. Finally, being able to predict which women will have a subsequent preterm birth may allow us to gain important insights into the mechanisms or pathways that ultimately lead to a preterm birth.[10,15]

Elevated serum ferritin level during the thired trimester are predictive of early spontaneous preterm delivery, possibly because these reflect an acute-phase reaction to sub clinical infection that are closely associated with premature delivery.[8]

Serum ferritin was 19.98±5.6290.50-26.00) and in PPROM group was 31.64±4.31(25.50-40.00), in the control group serum iron was19.44±4.83(12.40-30.20), and serum ferritin was 9.24±5.50(0-19.50). These finding are consistent with the study carried out by Saha *etal*., who found serum ferritin in the preterm labour group was (23.24±12.13), and in PPROM group was (29.44±28.41),compared to control group which was (8.69±3.7), and that carried out by Robert L who found high, but not low,plasma ferritin level, especially at 26 weeks, were strongly associated with subsequent preterm delivery.[1,15]

The possible explanation for higher serum ferritin level in patients with preterm labour and PPROM in this context could be iron overload or latent chorioamnionitis, and as iron overload has been excluded in the study by considering various hematological parameters, thus the high serum ferritin obtained in the preterm and PPROM is most likely a part of acute phase reaction to a sub clinical infection while Gopal *etal.,* reported a negative relation between serum ferritin level and preterm labour.[2,8]

In this study serum iron was significantly higher in control group 19.44±4.83 than in preterm labour 21.79±5.75 and PPROM25.12±11.80 while Kaneshige studied several hematological parameters during pregnancy he observed an increase in serum iron level in the first trimester as compared to that of non-pregnant women, then in third trimester giving a weak inverse correlation between serum iron and period of gestation.

Conclusion

Elevated serum ferritin level could be use as a predictor for prediction of spontaneous preterm delivery and PPROM at high risk of these complication, although it is worth mentioning that a larger study population such conclusion.

Conflict of Interest: Non

Source of Findings: Self findings.

Ethical Clearance: This research was carried out with the patient's verbal and hospital approval before the cases was taken.

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Evaluation the Effect of a Different Beta Blockers Agents on Somebody Metabolic Parameters in Patients with Essential Hypertension

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Abstract

Background: Hypertension is a common disease characterized by elevation of blood pressure above normal levels .The causes of Hypertension in most individuals cannot actually be determined. It is termed essential hypertension. Initial treatment of Hypertension to decrease blood pressure includes modification of lifestyle and medication. Beta-blockers is the most important antihypertensive agent that is accepted as a first-line antihypertensive agent, but may exert side effects on lipid and glucose metabolism, glucose tolerance and weight.

Method: The study was carried out on 60 individuals;Divided into three groups (A,B and C),they consisted of 20 individuals for each group (10 males +10 females). Three Beta-blockers agents were attended in this study: Propranolol 40 mg for group A, Atenolol 50 mg for group B and nebivolol 5 mg for group C. Systolic, diastolic blood pressure, pulse,HbA1c, Lipid Profile and BMI measured at two interval first at starting treatment second 3 months later.

Results: Results of group A showed significant decrease of pulse, SBP,DBP, HDL-c, high significant increase in AI, significant increase in Hb A 1c, TG,VLDL-c, BMI . No significant of TC and LDL-c. While the results of group Bshow significant decrease of pulse, SBP, DBP, and HDL-c, significant increase inHb A 1c, TG,VLDL-C, AI and BMI. No significant of TC and LDL-c. whereas results of group C showed a significant decrease in SBP, DBP and pulse, all other metabolic profiles showed no significant changes.

Conclusion: The current study concluded that Propronalol 40 mg Atenolol 50 mg and Nebivolol 5 mg were effective antihypertensive that decrease SBP, DBP, Heart rate with Nebivolol have favorable action on metabolic profile, Propronaloland Atenololcauseun favorable action on metabolic profile, but still used as antihypertensive.

Keywords: *Blood Pressure, Lipid Profile, HbA1c, BMI.*

Introduction

Hypertension is a common age progression disease characterized by an elevation of blood pressure above normal levels. It includes systolic SBP or diastolic DBP or both [1]. American College of Cardiology–American Heart Association 2017 Hypertension Guideline defined Hypertension as blood pressure(systolic) 130 mm Hg or more and or a diastolic 80 mm Hg or more[2] The causes of Hypertension in majority of individuals cannot be determined. It is termed Essential hypertension which a arising from many environmental, behavioral and genetic, factors other factors, such, stress, diabetes, obesity, life style, high sodium salt intake, and uses of medications, may increase incidences of hypertension.[3]

Beta-blockers is the most important antihypertensive agent, the exact mechanism of action of beta blockers is incompletely understood, Basically, antagonize catecholamines action on the beta-adrenoreceptors(β1, β2, β 3.)These blocked contribute to the therapeutic cardiac action, side effect,toxicity.[4] Blockers agents differ in their clinical action, duration, selectivity to receptors, vasodilating properties, intrinsic sympathomimetic activity (ISA)[5] . Blockers have been classified as nonselective first-generation (e.g.,

Propranolol), cardioselective β_1-blockers second-generation (e.g., Atenolol),third-generation β-blockade vasodilatory(e.g.Nebivolol) [6]Beta blockers is widely accepted as the first-lineantihypertensive agent in last four decades [7], Using Beta-blockers may exert an side effects on, lipid metabolism,glucose metabolism and tolerance, insulin action,weight[8].

Dyslipidemia is characterized by elevated triglycerides, fatty acids, diclaine HDL with dysfunction, increased slightly or normal (LDL)low-density lipoprotein cholesterol level with increased small dense LDL. Drugs such asbeta-blockers were found to alter lipids profile [9].Beta-blockers have effects on glucose metabolism,not all agents have same effect[10]. Therefore,it is important to select the agent not adversely worsen the glycemic state [11].

Overweight and obesity was health problems that threatening lifeand can induced serious diseases including hypertension[12] .Many guidelines introduced to measure obesity the most recent one is body mass index BMI thatis based on weight,height[13].

Materials and Method

Study Groups: This study include 60 individuals with Primary hypertension, no history of diabetes, hyper lipedemia, and not obese,divided into three groups A(Propranolol 40),B(Atenolol 50 mg) and C (nebivolol 5 mg)consist of 20 individuals (10 males +10 females) in each group.

Measurement of Pulse, Systolic and Diastolic Blood Pressure: By multiple reading of pulse, SBP, DBP using electronic devices main of the reading was taken at two interval of the study.

Blood sample collection: Five ml of blood was collected for each individuals at two study interval, The serum is isolated by putting tubes in water bath at 37ºC for 10 min, and centrifuged at 13000xg by refrigerated centerfuge for 10 min. The supernatant was taken to conserve in freezing at -20°c to be thawed for analysis

Measurement of the BMI: BMI of each individuals at two interval of study was calculated according to equation

BMI = Body weight (kg) divided by squared height (meter) = kg/m^2[13].

Measurement of Lipid Profile: The lipid parameter Total cholesterol (TC), Triglycerides (TGs) and high density lipoprotein- cholesterol (HDL-c) were determined by using a standard enzymatic assay (Fortress/UK kit)

Very low density lipoprotein- cholesterol (VLDL-c) and Low density lipoprotein- cholesterol is based on the following formula :VLDL-c = TG/2.2, LDL-c= TC– HLL-c – VLDL-c . [14].

Measurement of HbA1c: Two milliliter was collected in a tube containing ethylene diamine tetra acetate as an anticoagulant for determination of HbA1c for assessment of glyceamic state. Concentration of HbA1cwas measured after hemolysis of the anti coagulated whole blood specimen; assay techniques for HbA1c include affinity chromatography by using Stanbio-laboratory Kit, USA [15].

Statistical analysis of the data: Statistical analysis of data was conducted using SPSS for windows software. Value used as (mian ± standard deviation) Students paired T-Test was applied among pre and post value of the parameters. Difference between data considered significant at $P \leq 0.05$ (*) and high significant at $P \leq 0.01$(**)

Finding: Descriptive data of the individuals included in the study groups are presented in Table 1.

Table 1: Descriptive data of individuals of study groups

Parameters	Group A	Group B	Group C
Individuals (male/female)	20 (10 + 10)	20 (10 + 10)	20 (10 + 10)
Age/Years	49.4± 3.12	50.2± 2.88	50.5± 2.95
BMI Kg/M2	27.45 ± 0.93	0.74±27.2	27.85± 0.88
Smoking/alcoholic	0/0	0/0	0/0
Drug Used, Dose	Propranolol, 40 mg	Atenolol, 50 mg	Nebivolol,5 mg

Table 2: Pulse, SBP, DBPof study groups

Group C Nebivolol	Group B: Atenolol	Group A-Propranolol	Parameters	
87.2 ± 2.64	89.6± 2.85	89.4±3.69	pre	Pulse
79.6± 2.94*	77.8± 2.135*	78.2± 3.24*	post	
144.2 ± 5.249	145 ± 4.87	143.4±4 .66	pre	SBP
126.3 ± 4.98*	129.3 ± 544*	131.3 ± 4.32*	post	
88.4 ± 2.56	3.03 ± 89.2	87.3 ± 2.76	pre	DBP
3.21. ± 79.8*	84.3 ± 2.46*	83.3 ± 3.05*	post	

Significant at P≤ 0.05 (*) .

Table 3: HbA1C ofstudy groups.

Group C Nebivolol	Group B: Atenolol	Group A-Propranolol	Hb A 1c	
5.41± 0.35	5.44± 0.52	5.36 ± 0.45	pre	HbA1c%
5.49 ± 0.42	5.82±0.48*	5.62± 0.39*	post	

Significant at P≤ 0.05 (*)

Table 4: Lipid profile of individuals

Lipid Profile		Group A-Propranolol	Group B: Atenolol	Group C Nebivolol
TC mmol/L	Pre	5.158 ±0.10	5.21 ±0.155	5.139 ±0.157
	Post	5.21 ±0.149	5.25 ±0.12	5.207 ±0.144
TRG mmol/L	Pre	1.911 ±0.120	1.88 ±0.107	1.89 ±0.076
	Post	2.06 ±0.161*	2.008 ±0.134*	1.927 ±0.098
HDL-c mmol/L	Pre	1.331 ±0.068	1.346 ±0.056	1.319 ±0.0892
	Post	1.258 ±0.059*	1.297±0.0459*	1.316 ±0.0806
VLDL-c Mmol/L	Pre	0.868±0.0545	0.855±0.0457	0.859±0.0392
	Post	0.936±0.073*	0.912±0.0609*	0.879±0.064
LDL-c mmol/L	Pre	2.95±0.126	3.012±0.1708	2.96±0.205
	Post	3.02 ±0.185	3.047 ±0.157	3.01 ±0.167
ATHR--Index	Pre	3.88 ± 0.194	3.879 ± 0.184	3.91 ± 0.327
	Post	4.154 ± 0.202**	4..05 ± 0.158*	3.97 ± 0.261

Significant at P≤ 0.05 (*) .high significant at P≤ 0.01(**).

Table 5: BMI of study groups

BMI Kg/M^2	Group A: Propranolol	Group B: Atenolol	Group C: Nebivolol
Pre	27.45 ± 0.93	27.82± 0.74	27.96± 0.88
Post	28.6± 1.04 *	28.46±0.966*	28.35 ± 0.79

Significant at P≤ 0.05 (*)

Discussion

Results of Pulse, SBP, DBP in Table 2 showed significant decrease of Pulse, SBP DBP in all groups this result agreement with Rapole *et al.* 2017[161], disagree with Bharati *et al. 2*016[11] This result contributed to antagonistic action ofbeta blockers on beta-adrenoreceptors also Nebivolol with the vasodilatory properties have additional hypotensive effect due to decrease peripheral resistance. this vasdilatation

may produce a reflex to increase heart rate[17] which counteract the additional hypotensive effect .

Results of Hb A 1c in Table 3 show a significant increase of Hb A1c in groups A, Bbut no significant increase in group C. Result of group A is in agreement with most previous study, but the result of group B, and C was in agreement withFonseca VA 2010[18], Bharati *et al.* 2016 [11] showed no significant of atenolol at 12 weeks,but significant after 24 weeks while (Van Bortel *et al.* 2010)[191 showed that Nebivolol have significant improvement in glycaemic state. β-blockers were less opposed a1-activity.It may lead to cause vasoconstriction,.β-blockers may inhibit pancreatic β cells secretion of insulin and worsening glucose homeostasis[11]Nebivolol has favorable action due to its vasodilating properties [18]. Which have a protective for glycemic state Nebivolol a good choose for diabetic patients [20]

Results of Lipid profile in Table 4 show thatresult of group A show a not significant increase in TC, LDL-c, Significant increase in TG, VLDL-csignificant decrease in HDL–c,with high significant increase in AI .This result show worsening lipid control and agreement with Fonseca VA 2010 [18]. Result of groupB show a not significant increase in TC, LDL-c, significant decrease in HDL –c, and significant increase in TG, VLDL-c, AI, this result agreement with Bashi A,Y,D *et al.* 2010)[21]. While group C show a non-significant change of all lipid profile and agreement with Vakharia *et al.* 2018) [7].Beta-blockers agents (traditional) carry wide side effect on lipid homeostasis, not all member have the same effect. Catecholamines stimulatory effect on lipolysis mediated through beta receptors may have a regulatory action on lipid homeostasis which activate sensitive lipase of fatty cell to release free fatty acid and this regulatory action inhibited by beta blocked[7].Beta blockers agents inhibited lipoprotein lipase lead to elevated level of triglycerides, VLDL-cand decrease level of HDL-C, and may lead to exacerbation of preexisting hypertriglyceridemia[22] Nebivolol the vasodilating high selective beta 1 blockers with partial agonistic activity on beta 3 receptors, stimulate the endothelial nitric oxide release a signaling bioactive molecules that play an important function to regulate lipid, glycemic state, which show a favorable or neutral metabolic effect[9] several mechanism proposed that vasodilation reduce oxidative state and some reducing NO degradation, increase insulin sensitivity, control lipid and glycimic state [23]

Results of BMI in Table 6 show that a significant increase in groups A and B while group Cnot significant. (Wharton *et al.* 2018[24] showed that weight gain is associated with beta blockers for first few months as moderate manner and may be not significant later . The mechanism was not exactly know and may be explained by reduce expenditure resting energy, thermal food effect, tolerance of exercise in addition to inhibited process of lipolysis, also insulin resistance contributed weight gain[25] the antagonizes of adrenoceptorβ1, β2by traditional agents contributed this metabolic proses without or less antagonizes of β3 [26] Beta-blockade associated with 4% reduction in basal rate of metabolic and a 25% reduction of food thermic effect[27] Nebivolol has unique action as β -3 agonist with antioxidant properties and vasodilation mediated by release nitric oxide (No)which mediates a regulatory roles on glucose, lipid metabolism. With tolerate and exert less adverse metabolic effects than traditional beta blockers.[9]. Nebivolol, through β3AR, induce lipolysis and upholdthermogenic and mitochondrial genes. The stimulation of lipolysis and the thermogenicsequencer depend on β3 agonist activity and the consequent stimulation of thermogenicsequencer in human adipocytes. [28]

Conclusions

The current study concluded that Propronalol 40 mg Atenolol 50 mg, Nebivolol 5 mg were effective antihypertensive that decrease SBP, DBP,Heart rate, with unfavorable action of Propronalol and Atenololon metabolic profile including HbA1c, Lipid Profile and BMI while Nebivololhave favorable action of above metabolic profile which concluded that Nebivolol is the best beta blocked agent on metabolic profile but may be cause other side effect, Propronalol and Atenolol even cause unfavorable action on metabolic profile but these effect within the normal range of each parameters and still used as antihypertensive in which.That effect can be avoided by patient through change the dietary, physicalactivity and life style.

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Ethical Clearance: Taken from patients

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